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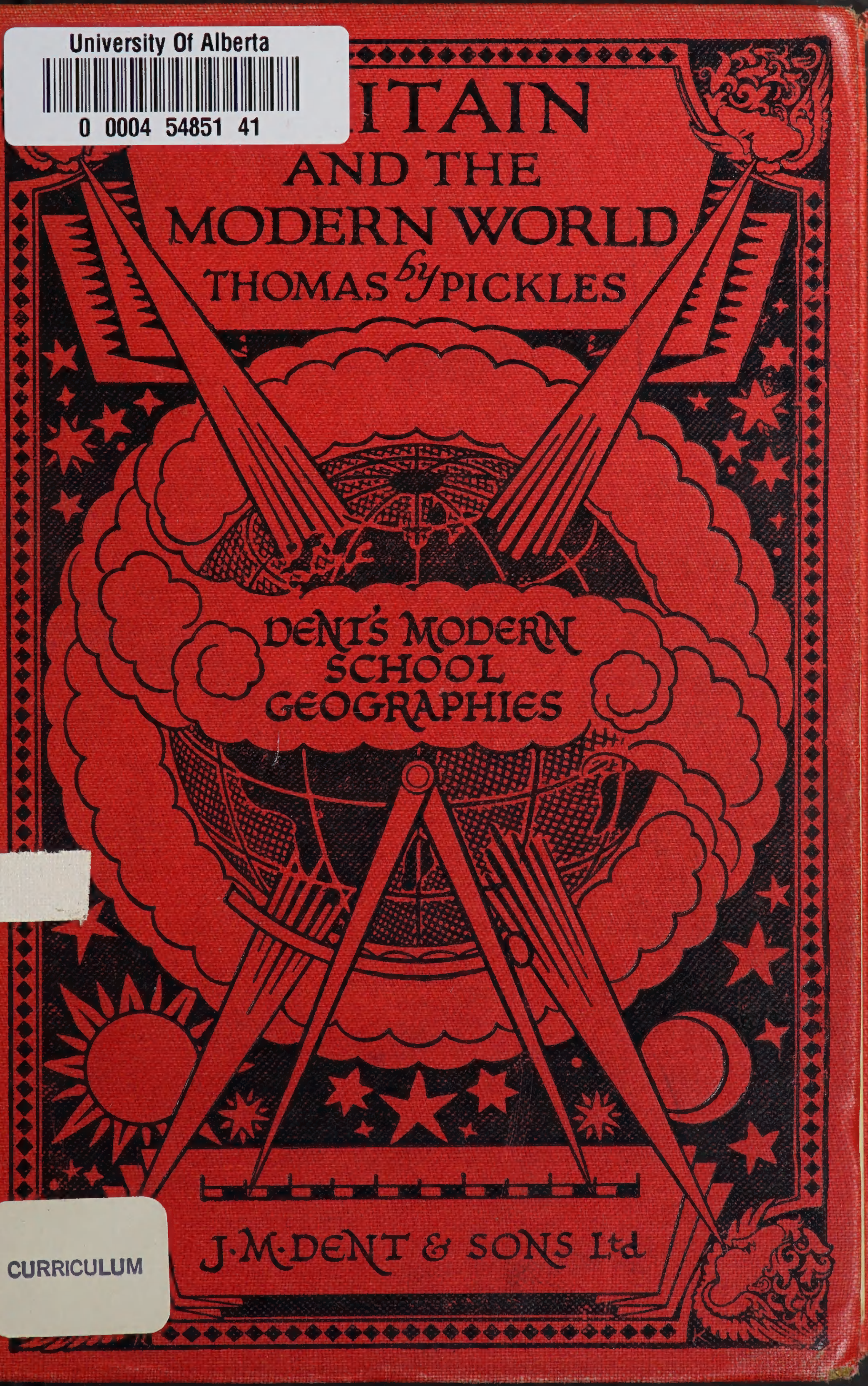

ITAIN AND THE MODERN WORLD

THOMAS PICKLES

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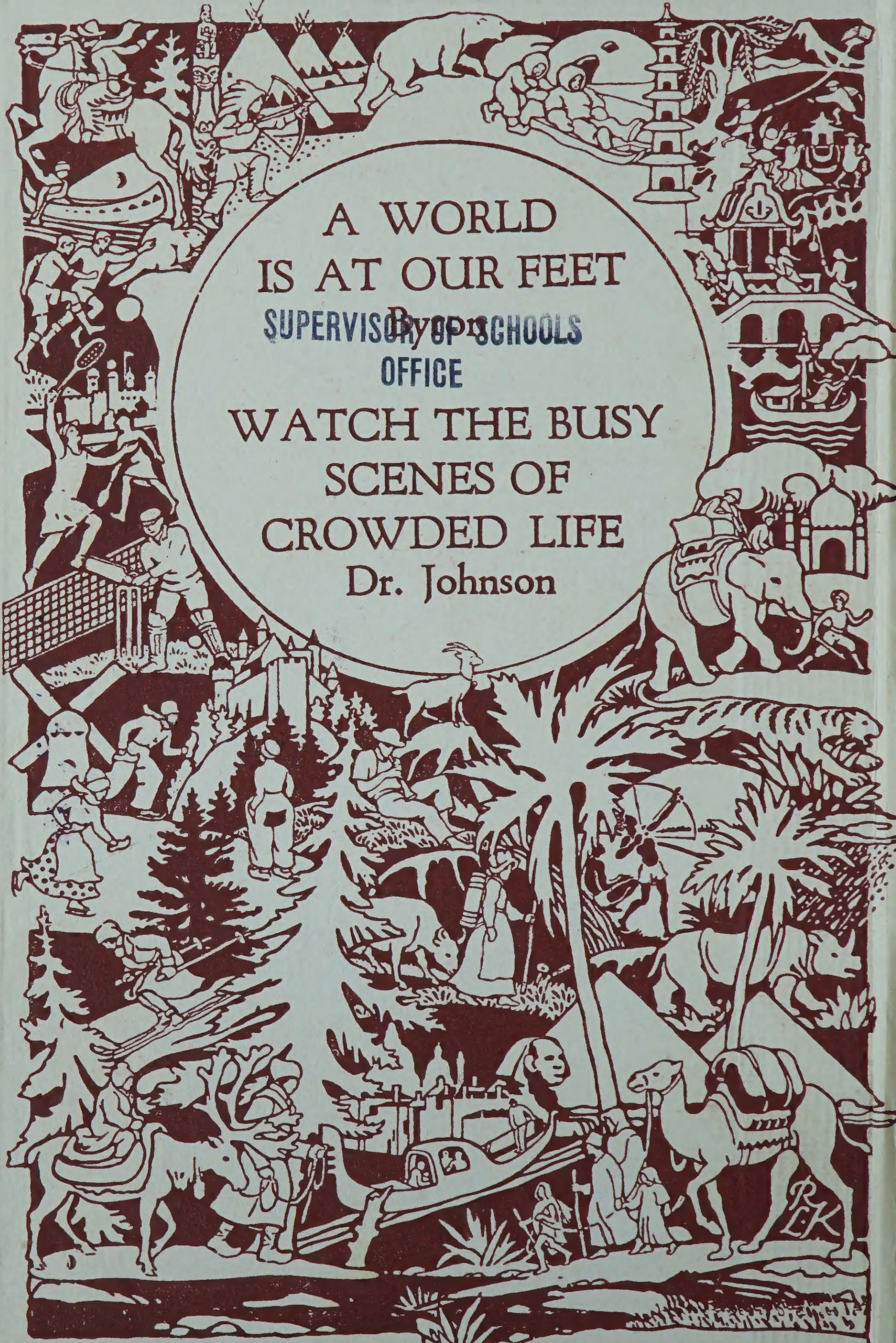

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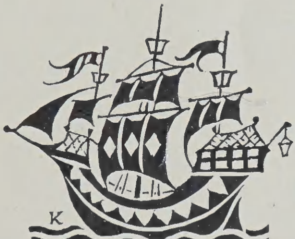
DENT'S MODERN SCHOOL GEOGRAPHIES

BRITAIN & THE MODERN WORLD

BY

THOMAS PICKLES, B.Sc.

Senior Geography Master, Holgate Grammar School, Barnsley



WITH
165 ILLUSTRATIONS

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PREFACE

THIS series of text-books is intended for pupils in Senior Schools, Central Schools, and the Junior Forms of Secondary Schools.

The books are most suitable for use in the following order:

1st year—Africa, Australia, and New Zealand.
2nd year—North and South America.
3rd year—Europe and Asia.
4th year—Britain and the Modern World.

As, however, each volume is self-contained, the order may be varied to suit the capacity of the pupils or the needs of the school course.

The regional grouping here adopted has the following advantages:

(1) The continents are dealt with in an ascending order of complexity, beginning with the relatively simple land forms and simple social organizations of Africa, and finishing with the highly complex region of western Europe.

(2) A large part of each year's course is devoted to the study of a major portion of the British Empire.

(3) The regional geography of the continents is covered in the first three volumes, the fourth being devoted to a study of Britain and a review of its relationship to the Empire and to the world as a whole.

In each book some aspects of the Geography of the British Isles are dealt with, so that a knowledge of our own islands is built up as the course proceeds. The present volume is planned primarily to follow the regional studies, but care has been taken to present the subject-matter in a form easily grasped by young pupils, so as to make it suitable for the final year in those schools which have only a three years' course.

Throughout the course emphasis is laid on the home life and daily work of the people. No attempt has been made to follow the so-called " scientific " sequence—" Position, Relief, Climate, Products, Occupations "—which too often succeeds only in killing the natural interest of the pupil. The aim has been rather to build up a conception of the varied activities of mankind in widely differing environments. It is confidently expected that the large number of illustrations which are included in each volume will very materially assist in this aim. For permission to use these, the author is deeply indebted to the various Consulates, Legations, Government Departments, Railway and Steamship Companies, etc., to whom acknowledgment is made at the foot of the reproductions ; to A. R. Addey, Esq. for figs. 17 and 19 ; and to F. B. Field, Esq. for fig. 92.

Special thanks are also due to B. W. Saville, Esq., who has kindly read the proofs.

T. PICKLES.

BARNSLEY,
April 1933.

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BRITAIN AND THE MODERN WORLD

SECTION I—THE BRITISH ISLES

CHAPTER I

THE FACE OF BRITAIN

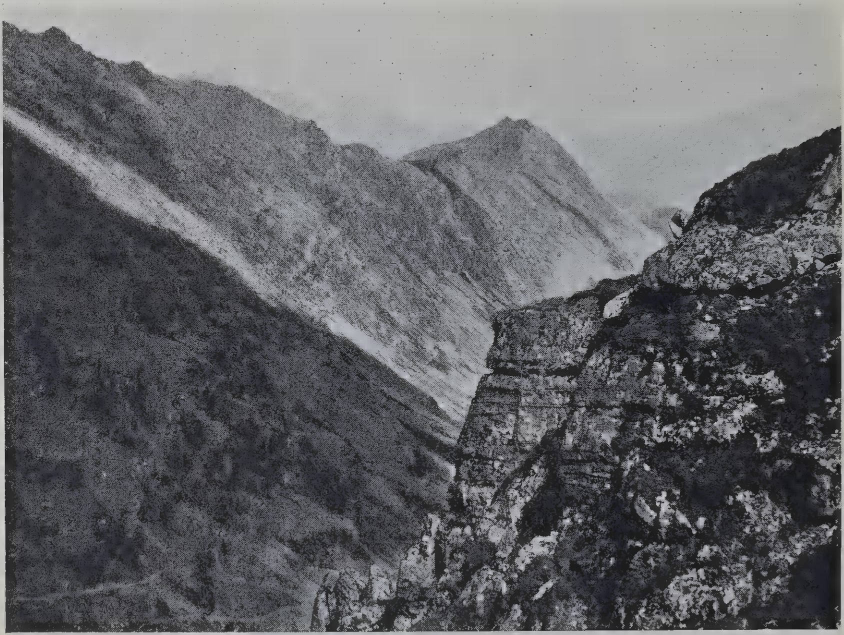
SUPPOSE a friend in a foreign country asked you to send him a picture-postcard showing what Britain is like.

No doubt your first impulse would be to send some pretty picture of a district near your own home. But if you stopped to think you would realise that, however good a picture it might be of a particular district, it would not be a picture of *Britain*. If you were wise you would ask your friend to wait until you had made a collection representative of all the chief types of scenery in our islands. If you did this you would soon realise that your pictures would have to be arranged in about six main groups such as: mountains, hills, plains, coastal scenes, rural scenes, and views of towns.

In each group you would, with the assistance of your friends, be able to collect such a great variety of scenes that it would be impossible to pick out one and say that it was typical of the whole group.

Perhaps, while you were making your collection, you would begin to wonder why the scenery varies so much from place to place—why some districts are mountainous, while others are level and low-lying; why some mountains and hills have jagged outlines, while others are smooth and rounded; why in one district there are many woods, while in another the surface is occupied only by carefully tended fields.

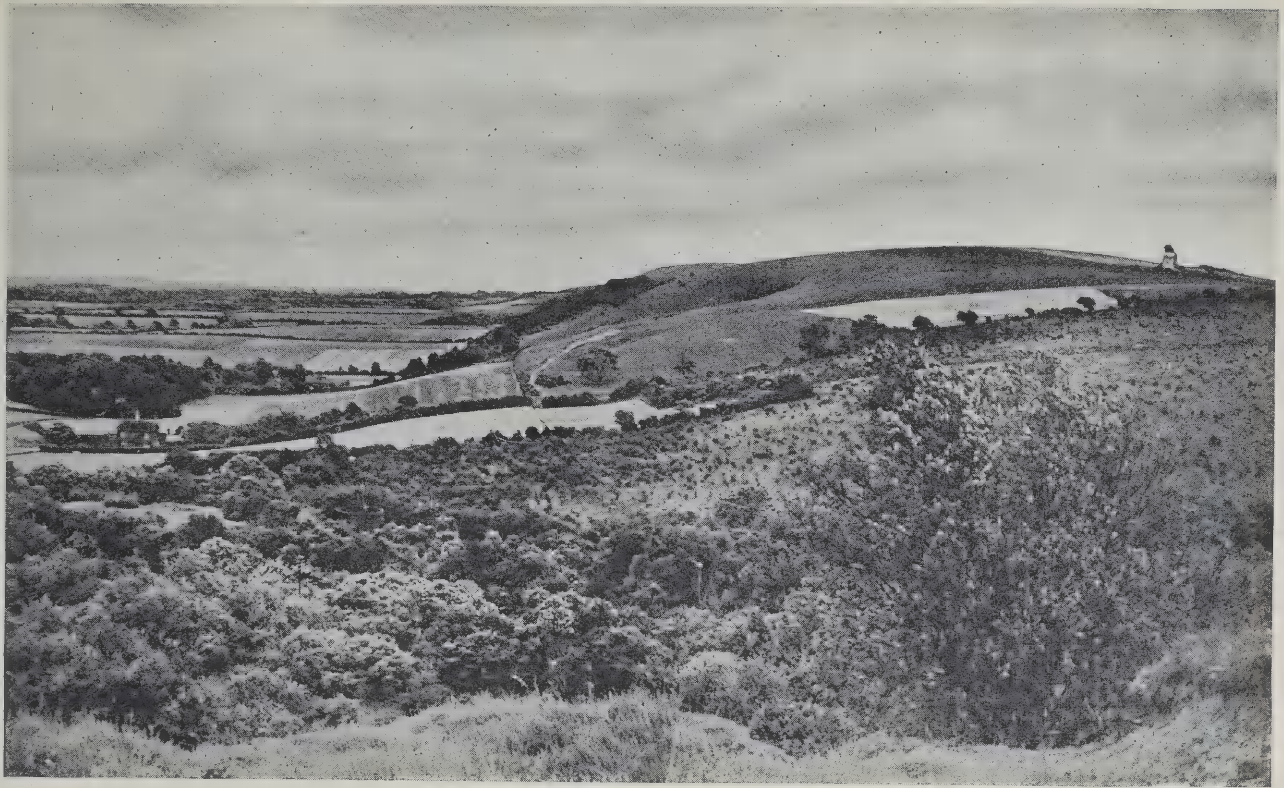
In trying to find answers to these, and a hundred other questions about the different types of scenery, we have to take into account the work of both Nature and Man. Nature has determined the *form* of the land. Mountains and plains, hills and valleys, beetling cliffs and rounded slopes, roaring torrents and placid lakes—these are her handiwork. Nature also clothes the naked form she has made; in one place she causes forests to grow, in another peat accumulates to form a desolate moorland, while elsewhere meandering streams overflow to make a dreary fen.



(G.W.R.)

FIG. 1.—VIEW FROM THE SUMMIT OF SNOWDON

Man, for his part, can alter the form of the land but little; here and there he may make a cutting, or pile up a mound of earth, dam a river or reclaim a small portion of the sea bed; but the outline of the land remains the same from generation to generation. He has, however, to a large extent " reclothed " the land by replacing forest and swamp

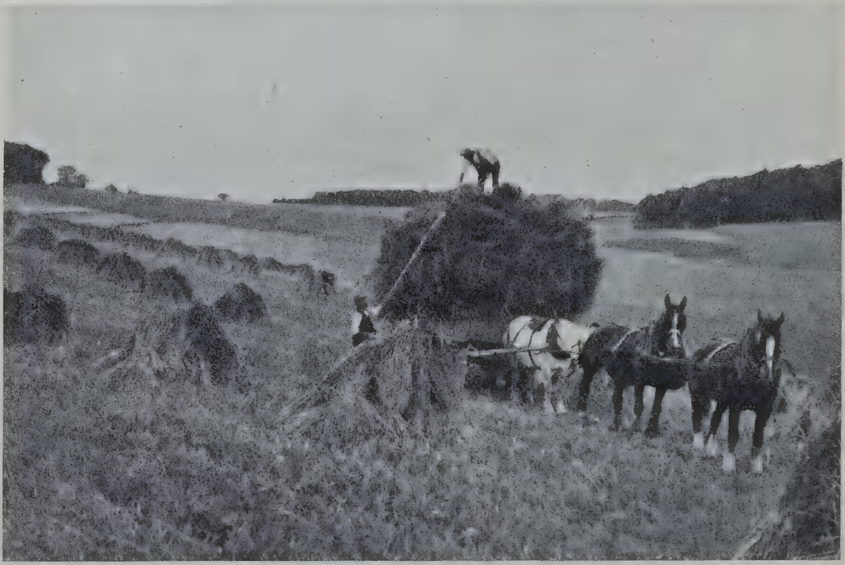


("*The Times*")

FIG. 2.—THE SOUTH DOWNS, SHOWING DITCHLING BEACON

by cultivated fields and by building houses, factories, roads, railways, canals and so on.

Every scene may be regarded as the result of a struggle between Nature and Man. In the mountainous districts Nature has won an almost complete victory, since there the land is too high, or too steep, or too barren, to make cultivation worth while. In the lowlands, however, practically every element in the scenery except " the lie of the land " is the handiwork of man. Even the grass in the fields is not " natural," but is the result of the determination of man to reclothe the land to suit his own needs. To do this he had to wage a fierce struggle with Nature, and even now, if he ceases his constant warfare against weeds and the coarser types of grass, Nature will quickly resume her sway. In the same way every lane and hedgerow, every cornfield and meadow represents the victory of man over Nature—though, of course, he has conquered Nature only by using her gifts of rain and sunshine and fertile soil.



(*Topical Press*)

FIG. 3.—HARVEST TIME IN ENGLAND

The two chief factors which determine the scenery of both highlands and lowlands are the *types of rock* and the *climate.*

Differences in the elevation and outline of the land are

at the Downs of south-eastern England, which are com-
sed mainly of chalk, owe their characteristic smooth
rves and gentle slopes.

The " soft " rocks, such as clay, shale and certain varieties
sandstone, constitute the lowlands of Britain. The Mid-
nd Plain of England, for example, is composed of clays and

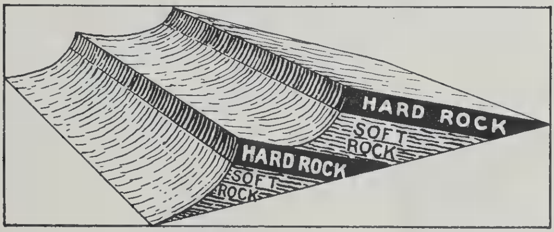


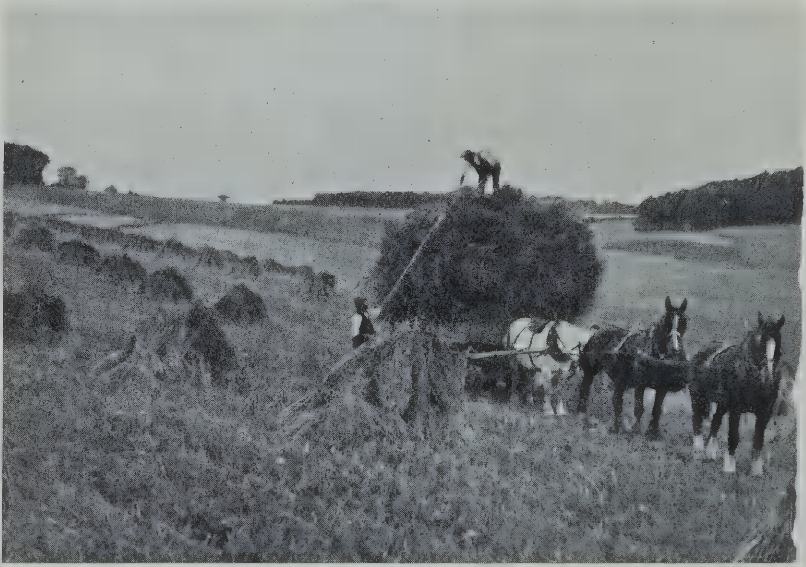
FIG. 6.—ESCARPMENTS

tones which are often grouped together under the term
Red Sandstone, while the plain around London is
osed of soft clay. Where layers of hard rock, such
ndstone, limestone and chalk, alternate with softer
, such as shale and clay the weather wears away
ofter rocks and leaves the hard rocks jutting out to form
pments, as shown in fig. 6.

early all the hills of south-eastern England are escarp-
due s, which are formed of limestone or chalk (see fig. 10).
are " hard "—that is, they are not easily worn away by the weather; such rocks, therefore, stand out as hills and mountains. It happens that nearly all the hard rocks, such as granite and slate, are found in the west and north of our islands. The Northern Highlands and Southern Uplands of Scotland, the Cumbrian Mountains, the Cambrian Mountains, Dartmoor, Exmoor, and the Irish

Mountains, exist because they are composed of hard rocks. If the rocks had been "soft," they would have been worn away by the weather during the scores or hundreds of millions of years which have elapsed since they were first upheaved by the forces of nature.

vation worth while. In the lowlands, however, practic
every element in the scenery except "the lie of the lan



(Topical

FIG. 3.—HARVEST TIME IN ENGLAND

is the handiwork of man. Even the grass in the field
not "natural," but is the result of the determinatio
man to reclothe the land to suit his own needs. To do

Even among the hard rocks, however, there are great differences which account for the great variety of mountain forms. *Slate* easily splits along certain planes, and so gives rise to sharp-edged mountains, while *granite* weathers into rounded masses like the "tors" of Cornwall.

Limestone and *sandstone* are "bedded" rocks—that is, they are formed of layers. As they are fairly hard rocks, they often stand out as moderately high hills, such as the Pennines. Usually, too, the edges of the layers of limestone and sandstone are marked by specially steep slopes on the hillsides.

Chalk is a "bedded" rock which takes on rounded outlines under the action of the weather. It is to this fact that the Downs of south-eastern England, which are composed mainly of chalk, owe their characteristic smooth curves and gentle slopes.

The "soft" rocks, such as clay, shale and certain varieties of sandstone, constitute the lowlands of Britain. The Midland Plain of England, for example, is composed of clays and sandstones which are often grouped together under the term New Red Sandstone, while the plain around London is composed of soft clay. Where layers of hard rock, such as sandstone, limestone and chalk, alternate with softer rocks, such as shale and clay the weather wears away the softer rocks and leaves the hard rocks jutting out to form escarpments, as shown in fig. 6.

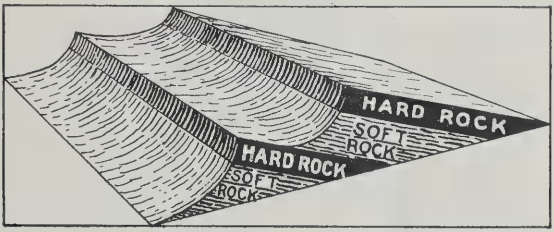


Fig. 6.—ESCARPMENTS

Nearly all the hills of south-eastern England are escarpments, which are formed of limestone or chalk (see fig. 10).

The different kinds of rock also affect the work men do, and so determine the way in which they "reclothe" the land. Some rocks, such as limestone and coarse sandstone, provide only poor soil, which does not encourage agriculture. In such districts, therefore, pastoral farming predominates, houses and roads are few, and towns are small and far apart. In other districts, where the soil is fertile, the land is covered with a variety of crops, and, as more men are employed, the villages are more numerous and the towns larger and more prosperous.

Even the smoky factory towns of the Midlands and the North owe their origin to particular types of rock—coal, iron-ore, etc.—which are mined in the neighbourhood.

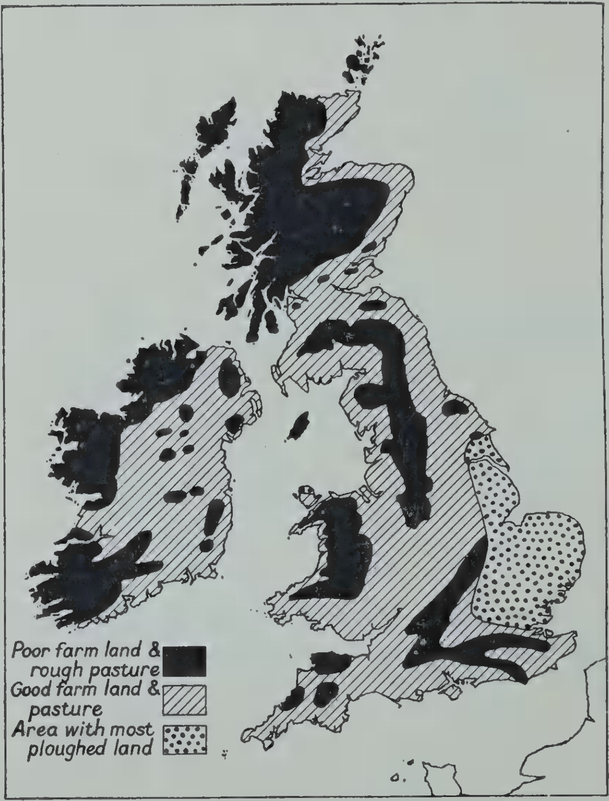


FIG. 7.—THE BRITISH ISLES. FARMING

Climate, like the rocks, affects both the form of the land and its "clothing." Frost breaks up the rocks, rain washes away the debris and carries it into the streams, which in their turn deposit it in the valleys or on the plains, or carry it out to sea, there to build up mud-banks and deltas. The bold, craggy outlines of our mountains are due largely to the action of frost, and the gentle curves of our hills and valleys are due in large measure to the action of running water. The abundant rainfall of our islands also favours the growth of forest and grass, and so accounts for the predominance of green in the natural landscape.

MAP STUDY

Rainfall.—If all the rain which fell in a particular spot during the year were to remain on that spot, none running off and none being evaporated, the depth of water at the end of the year would give the rainfall for that year. Actually, of course, rain cannot be measured in this way ; instead we use a rain gauge, which consists of a funnel, a receiver, and a measuring jar.

The rain which collects in the receiver is poured into a graduated jar which is so narrow that a depth of one hundredth of an inch over the area of the top of the funnel makes about one-tenth of an inch in the measuring jar. This enables us to measure the rainfall with great accuracy. If the readings for each day of the year are added together, this will give the total rainfall for the year. To make a map such as that in fig. 8 the annual rainfall of a great number of places is obtained, and the figures plotted on an outline map. Lines are then drawn joining places with the same rainfall.

Examination of fig. 8 shows that the western half of Britain has a much wetter climate than the eastern half. This is because most of our rain is brought by westerly winds which have to rise when they come to the mountains. As the air rises it cools, and the moisture condenses to form rain. When the winds reach the eastern side of Britain they have already lost the greater part of their moisture while passing over the high land. Such dry areas are said to be in the *rain-shadow* of the mountains.

The heaviest rainfall in the British Isles occurs near the west coast of Scotland, in the Lake District, and in Wales, the reason being that all these are mountainous districts which receive the moist winds directly from the ocean. The districts round the Wash and the Humber are the driest parts of Britain, since the land is very low-lying and the westerly winds have lost nearly all their moisture in passing over the hills and mountains of the west.

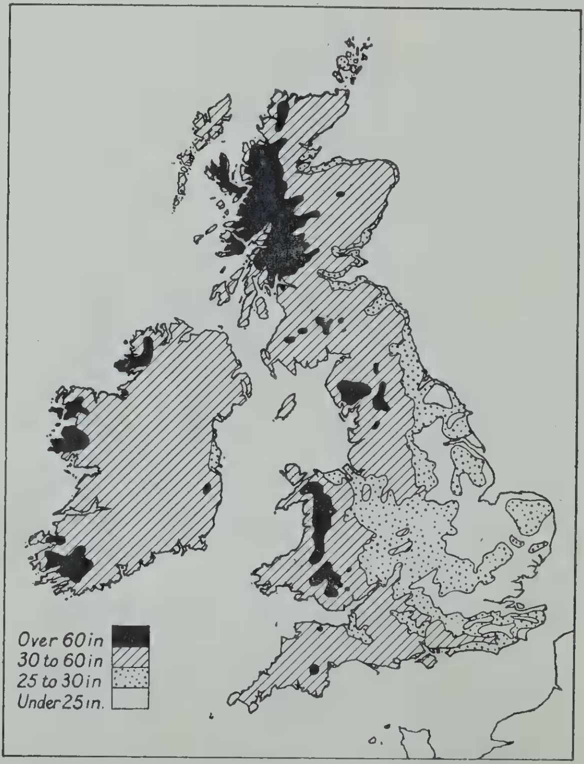


FIG. 8.—BRITISH ISLES. ANNUAL RAINFALL

Temperature is most conveniently measured by a *maximum and minimum* thermometer which is read once every twenty-four hours. On one side of the thermometer is an index which remains at the highest point the mercury reaches during the twenty-four hours, while an index on the other side marks the lowest temperature. The *mean temperature* for the day is obtained by adding together the maximum and the minimum and dividing by two. By averaging the mean temperatures of every day in, say, January, and then averaging all the January temperatures of many years, a true January average temperature is found.

The figures for a great number of places are then plotted on the map, and lines are drawn joining places with the same temperature.

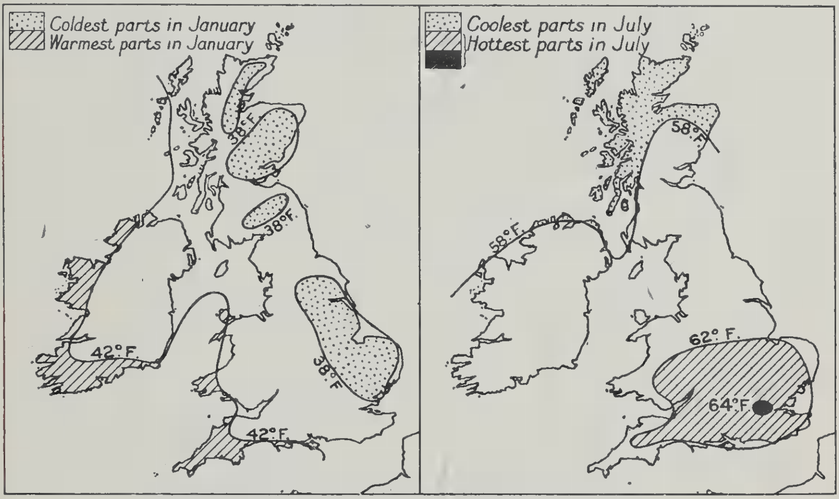


FIG. 9.—JANUARY AND JULY TEMPERATURES OF BRITAIN

Such lines are called isotherms. Those in fig. 9 show, not the actual average temperatures, but the temperatures as they would be if all the land were at sea level. For this reason they are known as "sea-level" isotherms.

Examination of fig. 9 shows that:

(*a*) The warmest part of Britain in July is London.
(*b*) The warmest part in January is the extreme south-west.
(*c*) The east coast is much colder than the west coast in January.

(*d*) The north-west corner of Scotland is very little colder in January than the south coast of England.

EXERCISES

1. Make a collection of views of our own country and arrange them under the headings mentioned at the beginning of this chapter.

2. On an outline map of the British Isles draw the 40° F. isotherm for January and the 60° F. isotherm for July. These isotherms divide the map into four sections. State :

(*a*) Which section is over 40° F. in January and over 60° F. in July.

(*b*) Which section is under 40° F. in January and over 60° F. in July.

(*c*) Which of the sections in (*a*) and (*b*) above has the greater difference between summer and winter temperatures.

3. Draw a simple sketch-map of Britain to show the parts which have an annual rainfall of more than 30 inches.

CHAPTER II

THE COALFIELDS OF BRITAIN

What is a Coalfield ?—If you look at the rocks in a quarry, or a cliff, or the steep bank of a river, you will see that they are usually arranged in beds or layers. Where a particular layer comes out to the surface we say it *outcrops* at that place. A coalfield is an area of land over which coal-seams outcrop. If, however, you walked across a coalfield, you would have to search long and carefully before you saw a coal-seam. You would see beds of clay, or shale or sandstone, but, as the coal-seams are seldom more than a few feet thick, and are usually overgrown with vegetation, you would not be likely to see one, unless it were exposed on the face of a quarry, or in an open working.

HOW COAL IS MINED

When men first began to mine coal, they began at the outcrop. When the coal near the surface was worked out, they would push farther and farther underground, making what is called a "day-hole" or an "adit." Where the seam is fairly deep, it is necessary to dig a vertical pit down

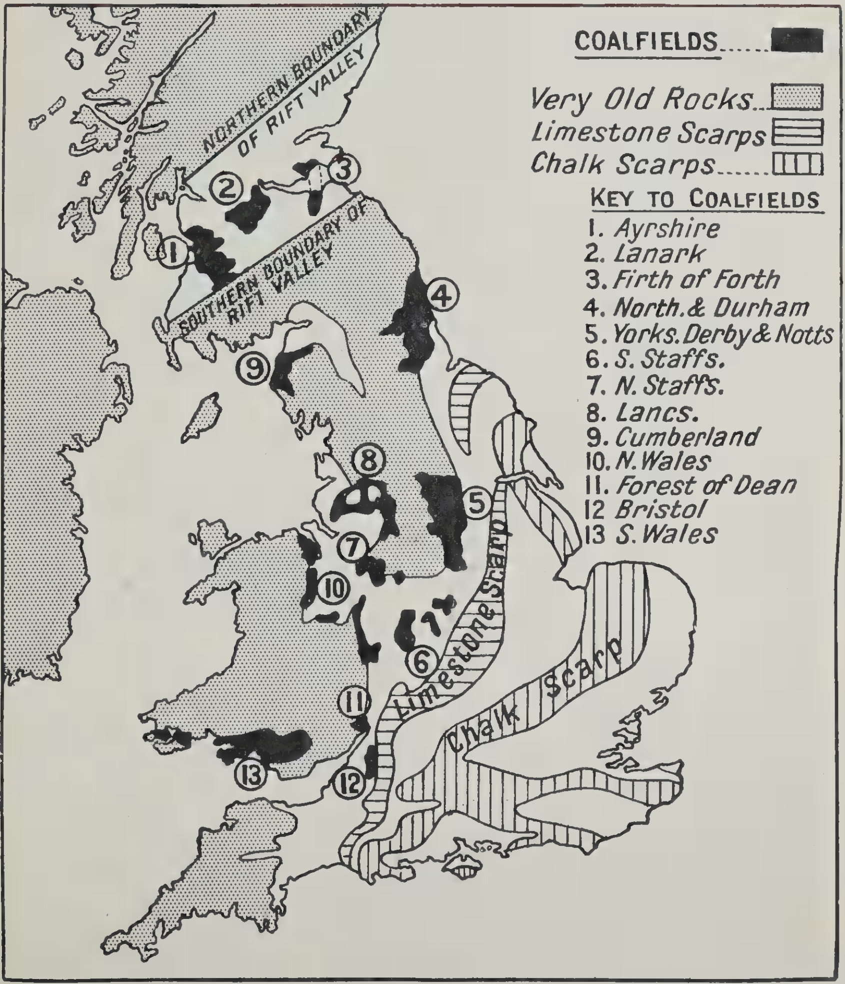


FIG. 10.—SIMPLIFIED GEOLOGICAL MAP

to the seam, as at A in fig. 11. It is from such pits that nearly all our coal is now obtained.

Sometimes it happens that though no coal-seams can outcrop at the surface, they can be reached by boring down through newer rocks, as at B in fig. 11. In such cases the coalfield is said to be "concealed." Around the edges of most of our "visible" coalfields, which are shown in black on fig. 10, there are fringes of "concealed" coalfields.

Everyone knows that the work of the miner is arduous and dangerous. As this last sentence was penned the writer heard the clatter of clogs in the distance—miners going to work. Let us follow them and see the work they do. At the pit-head each man is given a safety lamp which will light up his working place without danger of causing explosions through a naked flame coming in contact with gas that is sometimes given off from the coal.

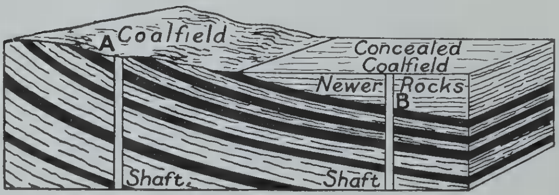
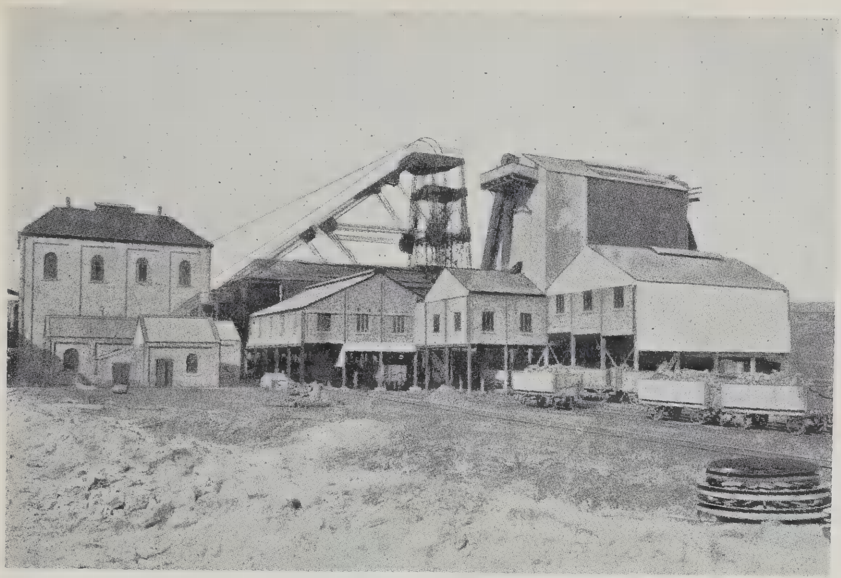


FIG. 11.—VISIBLE AND CONCEALED COALFIELD

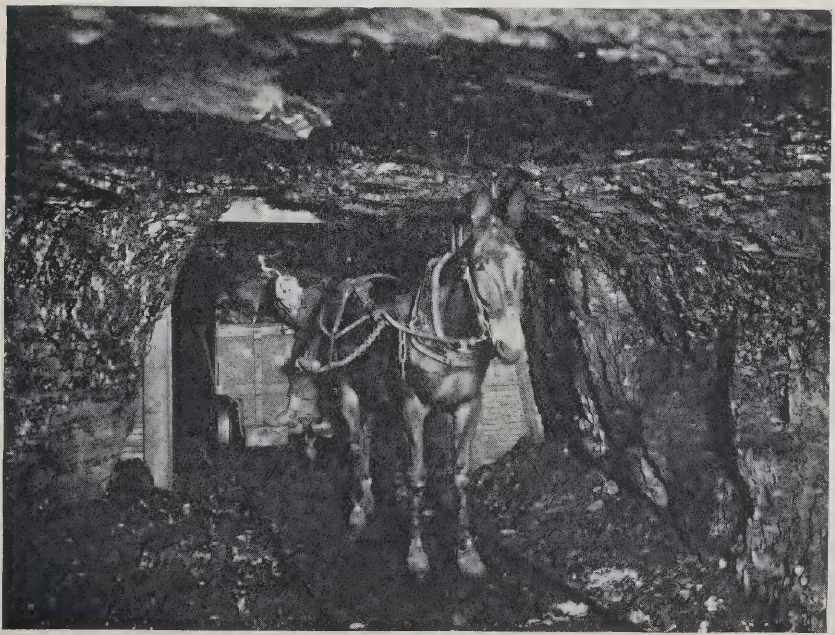
The men are lowered to the bottom of the shaft by a "cage," which takes ten or a dozen at a time. From there they may have to walk a mile or more through the underground galleries to the working face of the coal. There they first test the atmosphere for the dreaded "gas" and examine the roof to see that it is securely held up by pit-props. The "hewer" then sets to work to undercut the seam so that the coal may easily be brought down.

In many mines the undercutting is now done by electrically driven machines, which are capable of cutting a distance of three to five hundred feet along the bottom of a seam in a single shift (see page 170). Often the coal



(*Messrs. Dorman, Long*)

FIG. 12.—PIT-HEAD GEAR AT A COLLIERY



(*E. H. Gooch*)

FIG. 13.—HAULING COAL "TUBS"

will fall by its own weight when the seam has been undercut; if it does not it may be necessary to drill holes and blast it down. Great care has to be taken in such " shot firing," as there is great risk of explosion if the mine is a " gassy " one.

When the coal has been " won " it is loaded into small trucks or " tubs," which are hauled along roughly laid lines to the main haulage way, and thence to the bottom of the shaft. After being hauled to the top of the shaft, the coal is sorted into various sizes by passing it over screens which allow the smaller pieces to fall through them. In some cases the coal is washed to free it from all traces of dirt; in other cases it is merely placed on a moving " belt," on each side of which stand boys who pick out the lumps of stone or shale.

THE USES OF COAL

The total amount of coal produced in Great Britain is enough to supply every person with five or six tons a year. For a family of five that would be over two tons a month. Your parents will inform you that the average household does not consume a quarter of that amount. It is quite clear then that most of the coal mined in this country is used for other than domestic purposes. Some is used for the making of coal-gas; some is used for the making of coke, for use in iron-smelting; a good deal is used to get up steam for driving engines on the railways, in ships and in factories; and nowadays increasingly large quantities are being used for driving the dynamos which generate electricity, and for the manufacture of smokeless fuel and such by-products as carbolic acid, creosote, benzene, dyes, saccharine, high-explosives, aspirin, moth-balls, and a host of other products.

In spite of these numerous uses, far more coal is mined in Great Britain than is required by the country, and every year we export many millions of tons.

WHY THE COALFIELDS ARE DENSELY PEOPLED

If we compare the map of the coalfields with the population map (figs. 10 and 14) we see immediately that every coalfield is very densely peopled. Indeed, the only large densely peopled area which is not on a coalfield is that around London.

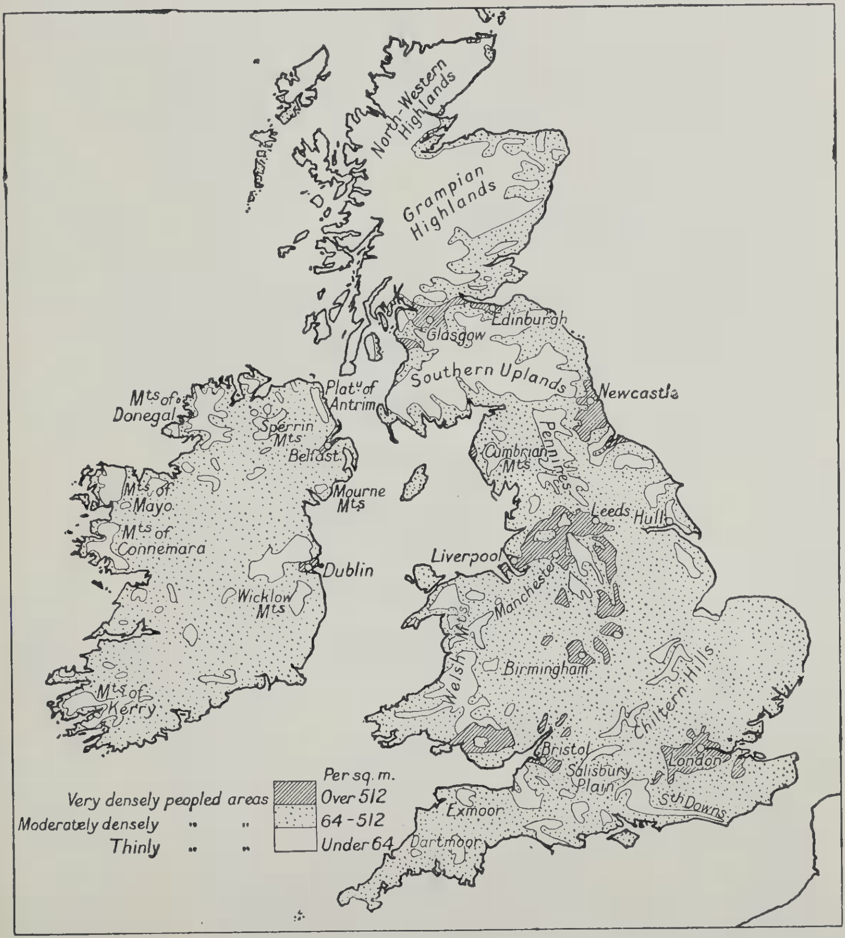


FIG. 14.—BRITISH ISLES. DENSITY OF POPULATION

The reason is not far to seek. Coal is needed to raise the steam which provides the power by which most of our factories are run. Coal is expensive to transport, and was even more so in the days when modern industry began to develop; consequently all the great industries grew up on or near the coalfields. Factories were built near the coal-mines; long, dreary streets of small houses were built around the factories, and so during the nineteenth century the population of the coalfields increased by leaps and bounds.

Nowadays many factories are run by electricity, which can easily be distributed to any part of the country. Consequently, new industries are growing up far from coalfields, but the older industries, such as the manufacture of cotton goods, woollen goods, and iron and steel, will always remain on the coalfields.

EXERCISES

1. Make a sketch of any quarry or cliff which shows rocks arranged in layers. You will see that some layers stand out farther than the others. Try to find out why this is so.

2. Make a plasticine or paper-pulp model on the lines of the block diagram, fig. 11.

3. Draw a graph to show the production of coal in Great Britain during the following years:

Year.	1923	1924	1925	1926	1927	1928	1929	1930
Production (millions of tons)	276	267	243	162	252	237	257	243

Try to find out (*a*) why there was such a small production in 1926; (*b*) why less coal is mined now than in 1923.

CHAPTER III

THE HIGHLANDS AND LOWLANDS OF NORTHERN ENGLAND

The Pennines are the " backbone " of northern England ; the rivers which run to the west and the east from its highest summits are like nerves spreading out from the spinal column ; and the east-to-west valleys divide the range up into half-detached areas of high land which may be likened to the vertebræ of a backbone.

The kind of scenery on the Pennines depends very largely on the kind of rock which crops out at the surface. The Northern Pennines, between the Tyne Gap and the Aire Gap, are composed largely of limestone, which occurs in almost horizontal layers. Where these layers come to the surface they cause a very peculiar type of scenery, which is due to the fact that limestone is *dissolved* by rain water. If the limestone is pure, no soil is left when it dissolves. For this reason the limestone plateaus of the North Pennines are practically bare of vegetation. Another result of the solution of the limestone by rain water is that there are no streams on the surface. During the course of ages the rain has made what appear to be great cracks in the rock, down which the water immediately disappears. One may walk for miles over the limestone hills, stepping from one block of bare stone to another, without ever touching a blade of grass or seeing a drop of water.

Where sandstone, or shale, or clay comes to the surface, there are plenty of streams, since the rainfall is very heavy on the high land. But as soon as these streams come to the limestone they disappear. In some cases the water seems to lose itself gradually in a mass of boulders, but in many cases the streams plunge headlong into a great hole. The best-known among such "swallow holes" is Gaping Ghyll, on the side of Ingleborough, where one of the head streams of the Aire plunges down a well-like abyss 365 ft. deep.

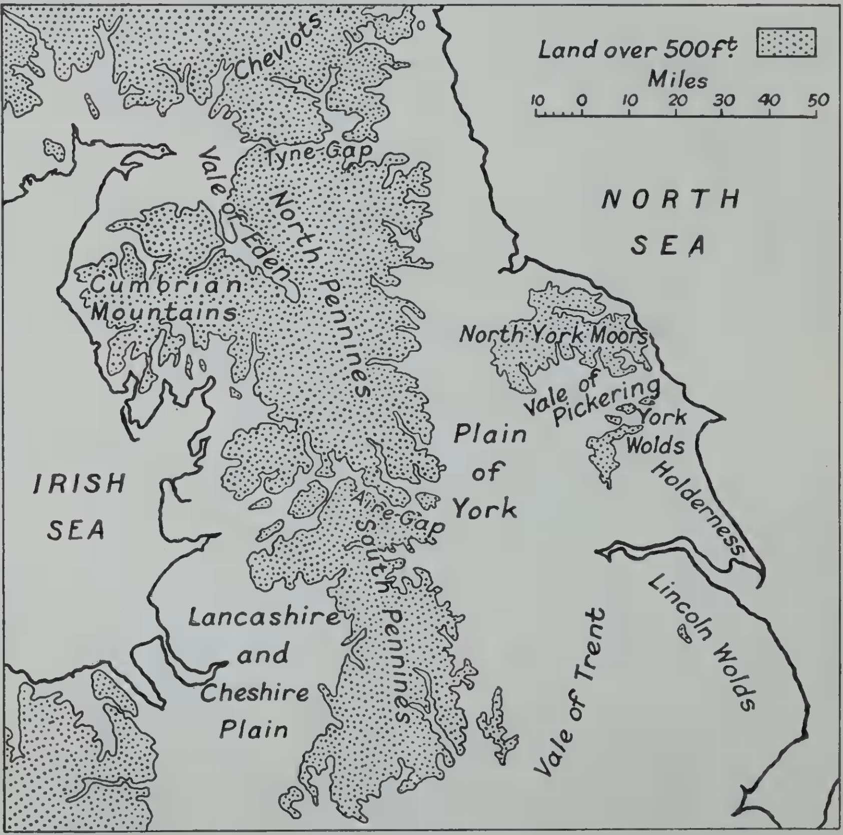


FIG. 15.—NORTHERN ENGLAND. PHYSICAL

"At the foot of this shaft is a vast hollow of such dimensions as to rank seventh among the caverns of the known world, and into it falls the highest known waterfall in England."[1]

Though no water is to be seen on the surface of the limestone, there are many underground streams. The

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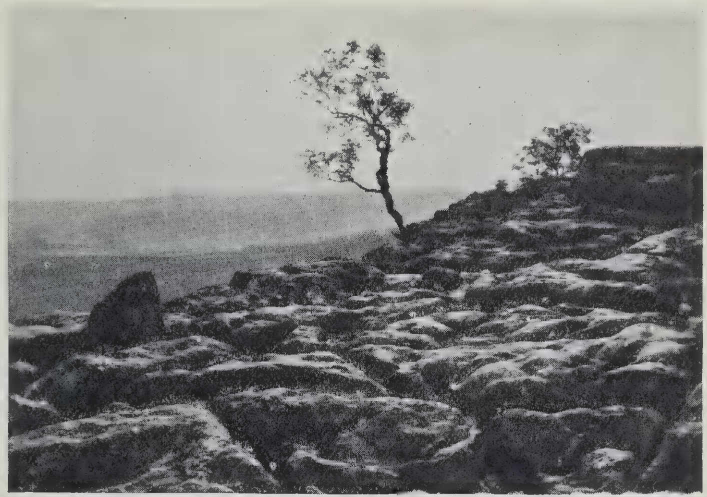
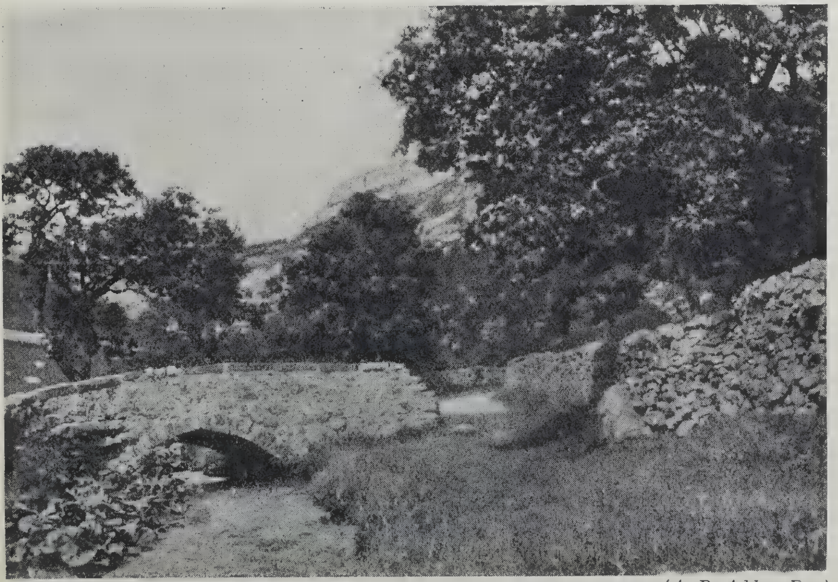
[1] Kendal and Wroot, *Geology of Yorkshire.*



(*Copyright, Walter Scott, Bradford*)

FIG. 16.—SURFACE OF THE LIMESTONE PLATEAU, NEAR MALHAM



(*A. R. Addey, Esq.*)

FIG. 17.—IN THE LIMESTONE DISTRICT, NEAR MALHAM, YORK

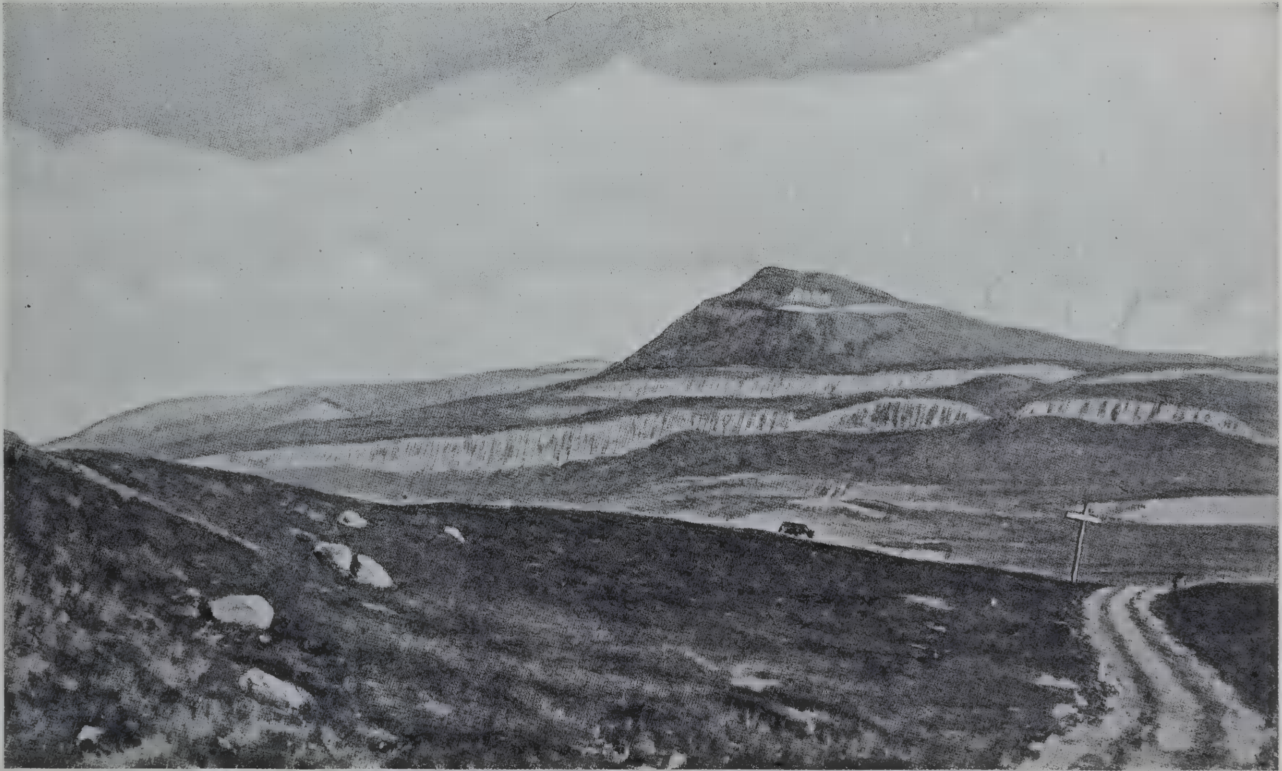


FIG. 18.—INGLEBOROUGH

course of these has been traced by mixing powerful but harmless dyes with the water which flows down the swallow holes, and then noting the positions of springs from which coloured water issues.

Another interesting feature of the limestone country is the prevalence of caves. In many cases small openings in the hillside have been found to open out into wide caverns extending miles underground. One noted cave on the side of Ingleborough follows an underground stream for over a mile, and leads to a beautiful lake in the very heart of the hill.

(*A. R. Addey, Esq.*)

FIG. 19.—A MOORLAND ROAD

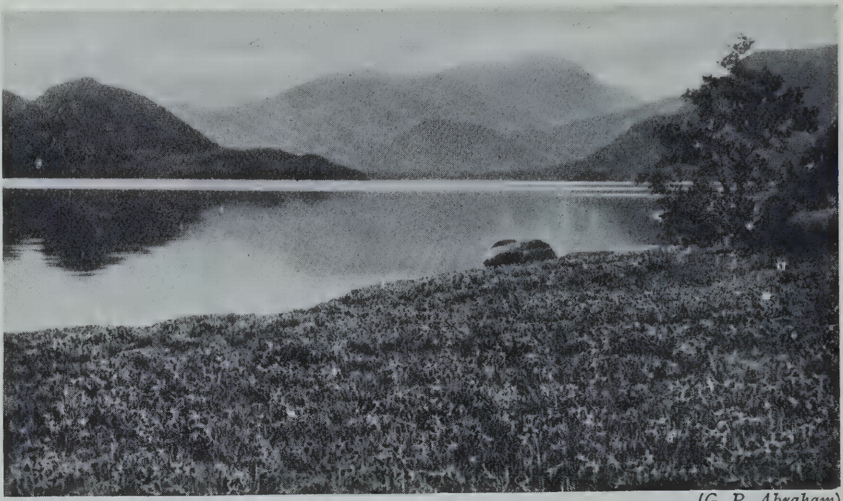
At the southern end of the Pennines, in the Peak District, limestone again comes to the surface, and a somewhat similar type of scenery is found. One river, the Manifold, takes its name from the fact that at several points in its course it disappears and comes to the surface some distance lower down the valley.

In the middle portion of the Pennines, between the Aire

Gap and the Peak District, the surface is formed by a coarse sandstone called Millstone Grit. (The rock is so called because it was formerly used for making millstones.)

Where the sandstone comes to the surface, there are plenty of streams and many deep, well-wooded glens. Above these picturesque valleys are wide-spreading wind-swept heather moors and peat-bogs.

The Cumbrian Mountains are very different from the Pennines. Not only are they much higher, but they are also made of much harder rock, which stands out in jagged peaks and knife-edge ridges. The deeply cut valleys radiate from the centre like the spokes of a wheel, and many are occupied by ribbon lakes. These latter owe their origin to the glaciers which crept down the valleys during the Great Ice Age. Some of the lakes occupy hollows which were scooped out by the ice, others are held up by embankments of clay deposited when the glaciers melted.



(G. P. Abraham)

FIG. 20.—WORDSWORTH'S " DAFFODILS " BY ULLSWATER

The scenic beauty of the Lake District attracts great numbers of tourists and holiday makers, and the " tourist industry" is one of the chief sources of livelihood for the inhabitants. The best time to visit the district is in April or May, for in these months the rainfall is lowest and the vegetation is freshest. Even in these months the weather is apt to be wet; the Lake District is, indeed, the wettest part of England, since the moist south-westerly winds are compelled to rise to a great height on encountering the mountains.

In spite of the heavy rainfall, sheep rearing is the chief farming industry. The commonest breed of sheep, the Herdwick, is remarkably hardy, and can live through the winter on the most exposed mountain sides. One peculiarity of these sheep is that, if removed from the farm on which they were born, they always find their way back, or perish in the attempt. For this reason new tenants on farms always take over the sheep already on the land.

The North York Moors and the Yorkshire Wolds, which lie to the east of the Pennines, may be looked upon as balancing the Cumbrian Mountains. But the comparison is not a very good one, for these eastern ranges are comparatively low hills. They represent the northern ends of the escarpments which cross south-eastern England, the North York Moors being formed of limestone and the Wolds of chalk. In both regions the chief type of farming is sheep rearing.

THE LOWLANDS OF NORTHERN ENGLAND

The Lancashire and Cheshire Plain lies between the Pennines and the Irish Sea. As it is swept by the mild, moist south-westerly winds it has a fairly wet climate, and is therefore an important dairy farming area. The farms of the Lancashire Plain specialise in the sale of fresh milk, while Cheshire is also famous for its cheese. The Fylde district, between Preston and Fleetwood, is one of the world's chief poultry farming districts.

The Plain of York, which is drained by the tributaries of the Ouse, is in the rain-shadow of the Pennines. Not only has it less rain, but it has also more sunshine than the Lancashire and Cheshire Plain. Consequently there is more arable farming, and large quantities of wheat, barley, oats, potatoes, root crops and vegetables are grown.

The Vale of Eden is a fairly dry lowland situated between the Cumbrian Mountains and the Pennines.

The Vale of Pickering lies between the North York Moors and the York Wolds, and the **Plain of Holderness** lies between the Wolds and the sea. All three are fertile farming areas.

EXERCISES

1. Using guide-books and maps, plan :

(*a*) A walking tour in the Lake District.

(*b*) A cycling tour in the North Riding of Yorks.

(*c*) A motor tour of 1,000 miles, during which you would see as many types of scenery as possible in Northern England.

2. Westmorland, Lancashire, and the East Riding of Yorks have respectively 6 per cent., 17 per cent., and 56 per cent. of their surface under plough. Account for these differences.

3. Find in your history book references to the early importance of York and Chester. Find out why these cities grew up.

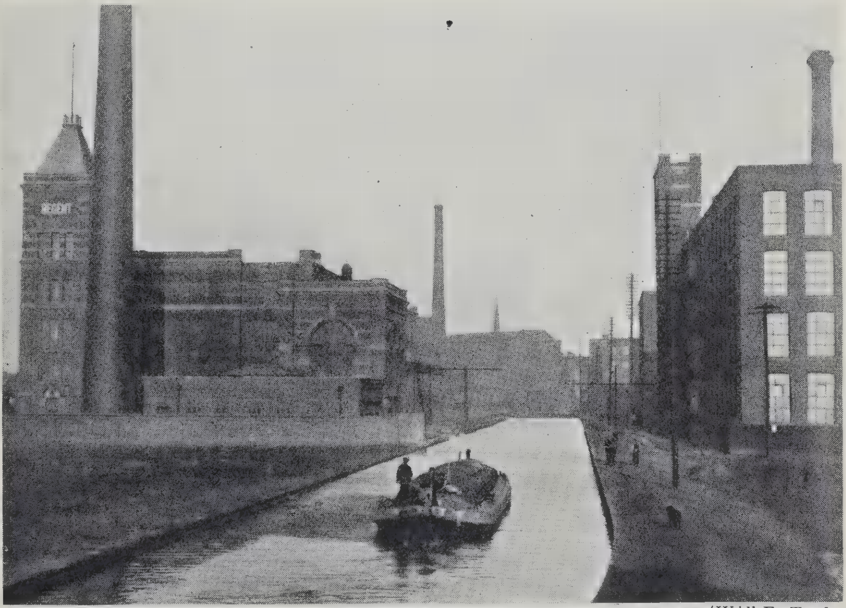
4. Which poets spent a great part of their lives in the Lake District? Look through their poems and write out some verses descriptive of the scenery.

CHAPTER IV

NORTHERN ENGLAND—MANUFACTURING DISTRICTS

I. THE LANCASHIRE COTTON INDUSTRY

THE commonest things of life have often the most wonderful stories to tell to those who can understand them. A piece of common calico can call up before our minds many varied scenes of human activity. It whisks us away in the twinkling of an eye to the cotton fields of America, and shows us the negro labourers sowing the seed, tending the plant, and picking the fluffy white balls of cotton. Then it takes us to the "ginning" factory, where the cotton is separated from the seeds, and packed into bales ready for

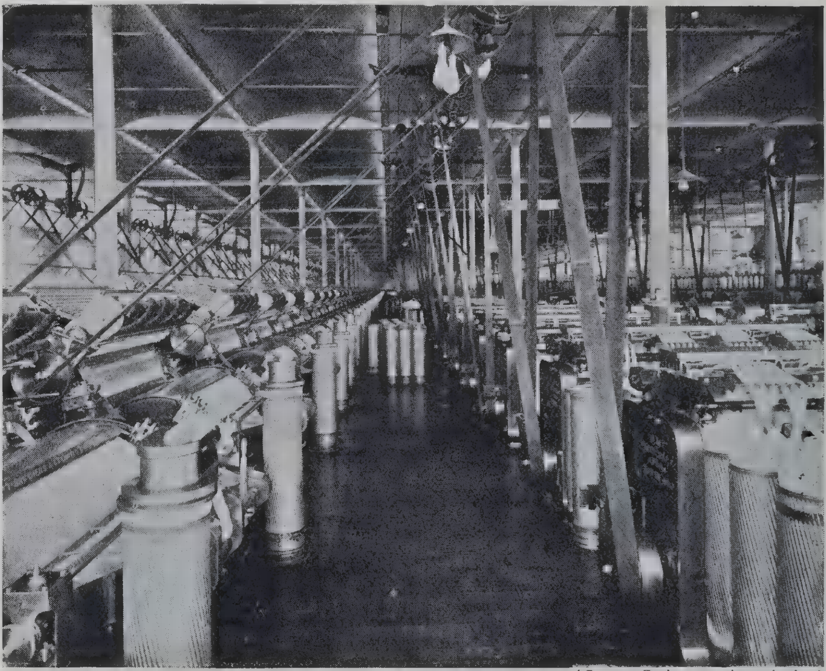


(*Will F. Taylor*)

FIG. 21.—LANCASHIRE SPINNING MILLS

transport. An instant more and we have crossed the Atlantic and see the bales of cotton being unloaded at the Liverpool docks, and taken away by motor lorry or goods train to some smoky factory town near Manchester. Here in some many-storied spinning mill the cotton is sorted and cleaned and passed through wonderful machines which comb out the short silky fibres, lay them parallel to each other, and twist them together to make a continuous thread so fine that a mile of it may weigh only a pound or so. The fineness of the thread is denoted in "counts," which originally referred to the number of threads which, placed side by side, would make a film an inch wide. Nowadays, however, it means the number of hanks, each of 840 yards, which together weigh one pound. Thus, if 40 hanks (or 19 miles) of thread weigh one pound, it is said to be "40's counts."

From the spinning mill the cotton is taken to a weaving factory or "shed" situated in one of the more northerly towns of the Lancashire coalfield. Here the threads are placed on rollers or "beams," which are then fitted into the looms in such a way that the "shuttle" containing the weft may pass backwards and forwards between the warp threads like an animated darning needle.



(*Cotton Spinners Association*)

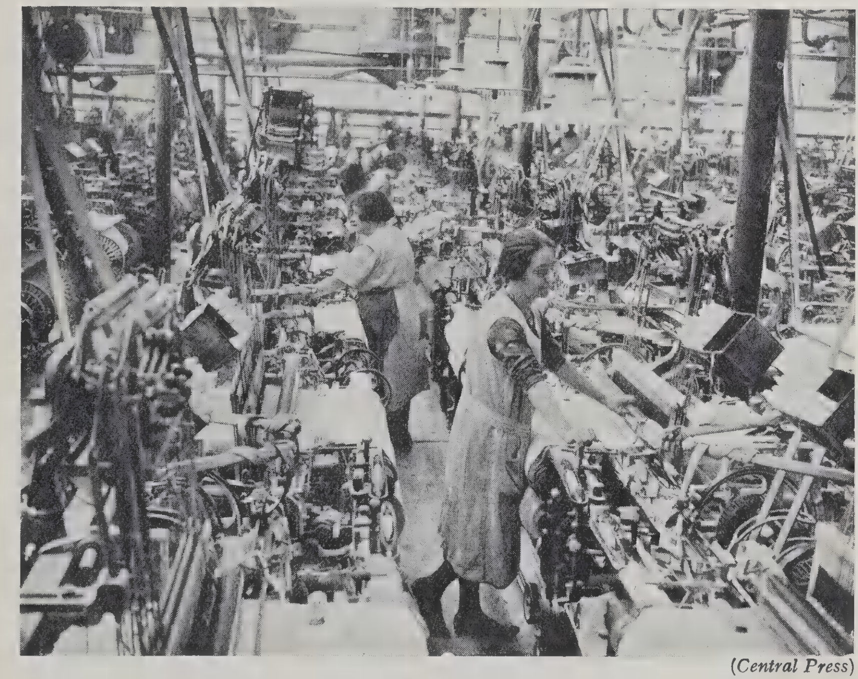
FIG. 22.—IN A LANCASHIRE SPINNING MILL

The "grey" cloth so produced is then sent to the bleachers, dyers or printers to be made ready for the market.

For many kinds of patterned cloths, however, both warp and weft have to be dyed before the weaving process.

How many pairs of hands have been employed in the making of that little-prized piece of calico which started us on this long train of thought?

Far more, certainly, than have been suggested in the above paragraphs, for in both spinning and weaving factories there are many minor processes which have not been mentioned. Moreover, should we not include the men who make the dyes, the bleaching chemicals, and the spinning and weaving machines, and even the miners and quarry men who supply the iron from which the machines are made, and the coal by which the factories are run? But if we go so far, where can we stop? Where does the miner get his pick-axe? Who supplies him with the food which



(Central Press)

FIG. 23.—INSIDE A LANCASHIRE WEAVING SHED

gives him strength to work? Indeed we cannot find end or beginning to the story. It is like a hopelessly involved version of the "House that Jack Built"—"This is the pick that hewed the coal, that heated the boilers, that drove the engines, that drew the train, that carried the cloth, that was woven from the weft, that was made by the spinners . . ." and so on, till we have gone all round the world and back again.

Perhaps we had better return to Lancashire and its cotton industry. As will be seen from fig. 24 the cotton-manufacturing area is situated on the Lancashire coalfield, which stretches from the Pennines on to the Lancashire Plain. Here is manufactured at least 80 per cent. of all the cotton cloth produced in the country, and though every town has many other minor industries, the vast majority of the workpeople are employed in the cotton factories. Most of the cotton spinning is carried on in the towns near Manchester, Bury, Bolton, Oldham and so on; while the towns on the northern edge of the coalfield—Blackburn, Accrington, Burnley, etc.—are chiefly engaged in weaving.

Reasons why the Cotton Industry grew up in Lancashire.—1. The Lancashire hand-loom weavers were the first to make much use of cotton in place of wool or flax. Early in the seventeenth century cotton cloth was being manufactured in Lancashire from cotton imported from the East.

2. Most of the great inventions of spinning and weaving machinery were made in Lancashire.

3. When water power began to be used for running factories, the rapid streams from the Pennines were found very useful for this purpose.

4. When steam began to be used for driving machinery the necessary coal was provided by the Lancashire coalfield.

5. Lancashire has a damp climate, since it is in the direct track of the moist south-westerly winds. Cotton is more easily spun and woven in a damp atmosphere than in a dry one; Lancashire weavers, indeed, can often tell

when the wind changes from west to east, by the greater frequency with which the threads break.

6. The port of Liverpool is very conveniently situated for trade with America, and the Liverpool merchants were quick to seize the opportunity of trade with the cotton-growing districts in the United States.

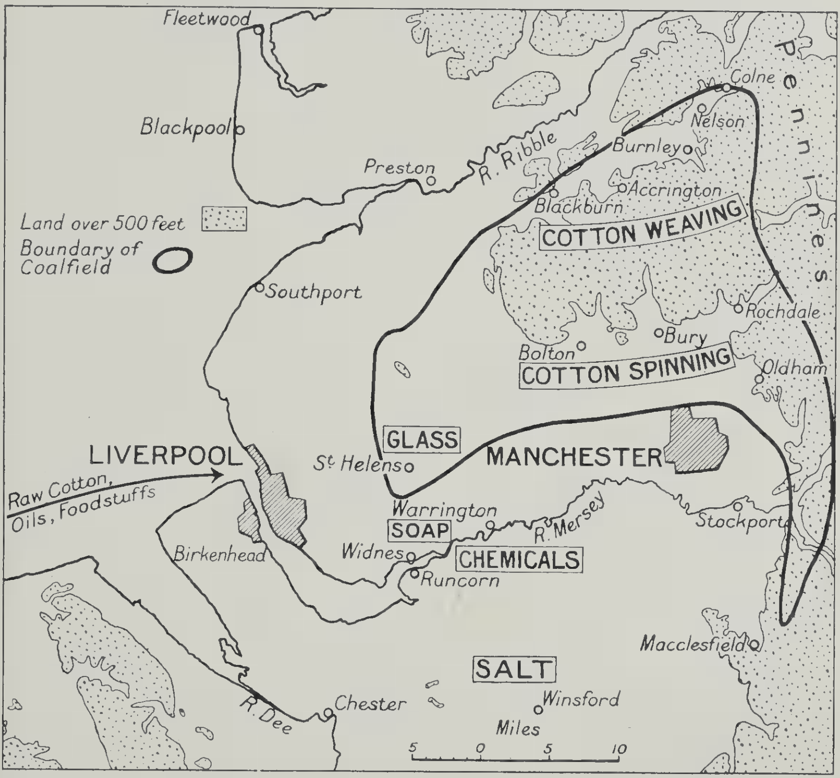


FIG. 24.—THE INDUSTRIAL AREAS OF LANCASHIRE AND CHESHIRE

THE COTTON TOWNS.—It will be noticed that the cotton towns can be arranged in two groups. Near the southern edge of the coalfield is the "spinning crescent"—a group of towns such as Bolton, Bury and Oldham, which specialise in spinning and do very little weaving. Here the most characteristic buildings are the many-storied, thousandwindowed spinning mills. Near the northern edge of the coalfield is a line of towns—Preston, Blackburn, Burnley, etc.—which specialise in weaving. Here the most characteristic buildings are the weaving " sheds "—single-storied, stone-built structures without windows at the sides but with rows of " skylights " in the roof.

All the cotton towns grew very rapidly in the latter half of the nineteenth century, and to accommodate the rapidly increasing population long, dreary rows of houses were built, without regard to appearance or the need for open spaces. But the Lancashire cotton operatives are fortunate in being near the wooded dells and heather-clad moors of the Pennines, so that it is easy to escape for a little while from the smoky town to the unspoilt countryside.

Once a year, too, the factories close down for a week, and most of the workers go to the seaside. Each large town has its own " wakes week," for if several towns took holiday together it would be impossible for all the people to be accommodated at Blackpool and other favourite resorts.

Manchester is the metropolis of the cotton-manufacturing district, although it is not so important either for spinning or weaving as some of the smaller towns. It is the great marketing centre, and manufacturers from all over Lancashire meet at the Royal Exchange to transact business. Here also are concentrated the warehouses and offices of the chief manufacturing firms whose works are situated in various parts of the country.

In 1894 the Manchester Ship Canal was completed and the city is now the fourth port of the British Isles. Though it is still far outclassed by Liverpool as a cotton port, it now imports nearly one-third of all the cotton used in England. It is also one of the chief centres for the importation of petroleum and foodstuffs. The city has also developed a great engineering industry in the Trafford Park district, situated near the Ship Canal docks.

II. THE MERSEY ESTUARY

Near the head of the Mersey estuary is a group of towns—Widnes, Runcorn and Warrington—which are engaged in the **chemical industry**. The chief raw material of the industry is salt, which is obtained from the Cheshire salt-field. Though the salt occurs in layers deep down in the earth, it is not usually mined, like coal or iron ore. Instead, bore-holes are made and brine is pumped up. The water is then evaporated, leaving the salt. Some salt is, of course, sold for domestic uses, and a good deal is sent to such fishing centres as Yarmouth and St. John's (Newfoundland), but the greater part of it is used in the chemical industry. There it is made into bleaching powder, washing soda, caustic soda and other chemicals needed by various industries.

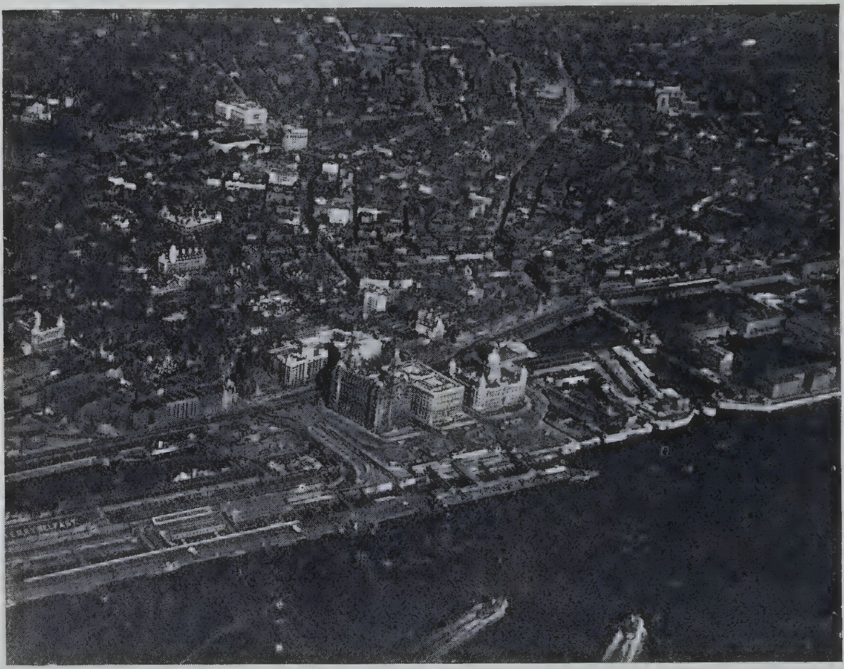
Just as in the chemistry laboratory little could be done without a bunsen burner, so in the chemical industry coal is a prime necessity. In the case of the Mersey towns, this is easily obtained from the near-by Lancashire coal-field. Fig. 24 and the atlas maps show how well situated these towns are—between the coal of Lancashire and the salt of Cheshire, on the Manchester Ship Canal, and at the meeting-point of several railways.

Soap is also manufactured in several Merseyside towns, especially at Port Sunlight and Warrington. The chief raw materials required for the industry are oil or fat, caustic soda and common salt. As we have seen, the last two are supplied locally ; most of the oil and fat has, however, to be imported—vegetable oils such as coconut oil and palm oil from the hot, wet equatorial lands, and animal fat from the great ranching lands.

Glass is manufactured at St. Helens. The chief raw material is pure sand, which is mixed with lime and various chemicals, and melted in a furnace generating a temperature of 1,300° C. to 1,500° C.

As shown in fig. 24, St. Helens is situated on the coalfield and near the chemical district, and from both it receives the materials required by its great industry.

Liverpool is the second largest port in the British Isles. It serves not only the Lancashire cotton district and the Yorkshire woollen district, but also the Midlands. Its chief import is cotton, but wheat, meat, wool, dairy produce and oil also stand high on the list.



(*Aerofilms*)

FIG. 25.—AIR VIEW OF LIVERPOOL DOCKS

As a passenger port it is second only to Southampton, and from its docks large liners sail to all parts of the world. The foodstuffs and raw materials which it imports form the basis for such industries as flour-milling, sugar-refining, and the manufacture of margarine, soap and chemicals.

Birkenhead, on the Cheshire side of the estuary, is now being joined to Liverpool by a tunnel under the Mersey. " This will be the largest tunnel for vehicular traffic ever constructed ; it is 2·13 miles in length, and when completed will have cost over £7,000,000. Travelling at fifteen miles an hour some 3,000 cars can pass through the tunnel per hour."[1]

III. THE NORTH-WESTERN INDUSTRIAL DISTRICTS

This region includes the Cumberland Coalfield and the Furness iron-mining district. The coalfield is only a small one and produces less than 1 per cent. of the total amount mined in Britain. One very interesting fact about it, however,

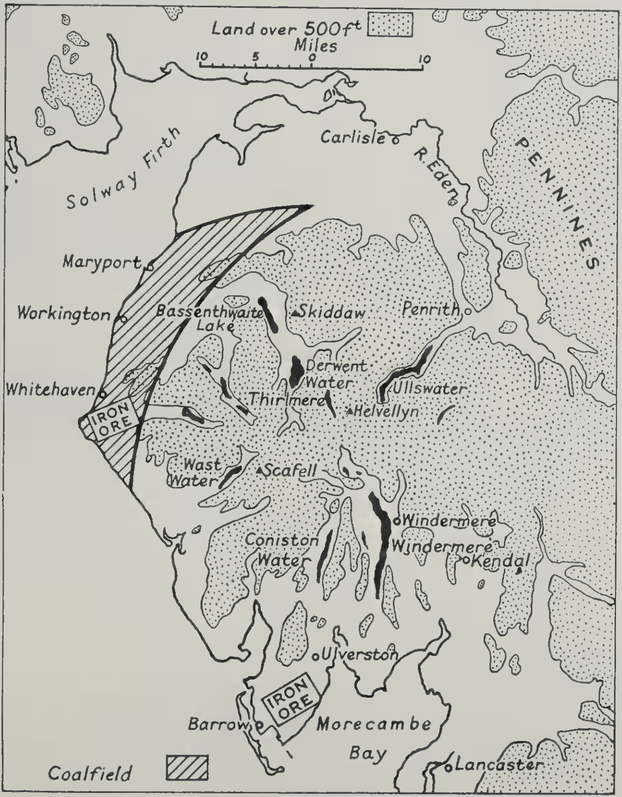


FIG. 26.—THE LAKE DISTRICT AND THE CUMBERLAND COALFIELD

is that the coal-seams continue seawards and some of the mines extend far under the sea. The chief towns on the coalfield are Whitehaven and Workington, neither of which contains 25,000 people.

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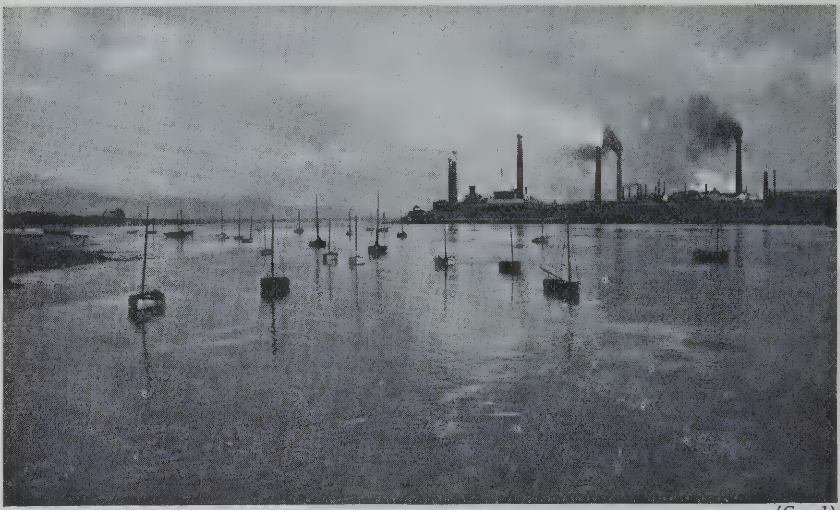
[1] *Manchester Guardian : Commercial Supplement.*

The **Furness District** is part of Lancashire, although it is cut off from the main body of the county by a branch of Morecambe Bay. In this district is mined the dark-brown, kidney-shaped masses of iron ore known as *haematite*. The ore is smelted chiefly at Barrow-in-Furness, which is situated opposite Walney Island. In 1847 it was a fishing village with a population of 325. Then an artificial harbour was made, furnaces, steel-works and shipbuilding yards were erected, and the town grew up very rapidly indeed. It is also an important centre for the manufacture of jute, flax and paper.



(*Gooch*)

FIG. 27.—STEEL WORKS, BARROW

EXERCISES

1. Examine a piece of cotton cloth with a lens and notice the way in which the threads interlock.

2. Prepare a short account of the life of one of the following

inventors: Crompton, Arkwright, Kay, Hargreaves; be ready to explain to the class the part he played in building up the modern cotton industry.

3. Look up in a dictionary or encyclopedia the meaning of the terms: flannelette, twill, calico, muslin, cheesecloth, gingham, nainsook. Try to find the names of other varieties of cotton cloth.

4. The chief imports of Manchester are: *Cotton* from the U.S.A., Egypt, Anglo-Egyptian Sudan, and Peru; *Dairy Produce* from New Zealand and Canada; *Petroleum* from the coast lands of the Caribbean Sea and the Gulf of Mexico; *Wool* from Argentina. Mark and name the above countries on a map of the world, and show the sea routes by which the products come to Manchester.

CHAPTER V

NORTHERN ENGLAND—MANUFACTURING DISTRICTS (*continued*)

IV. THE INDUSTRIES OF THE YORKS, DERBY AND NOTTS COALFIELD

A. The West Riding Woollen Industry

The woollen industry of the West Riding of Yorkshire and the cotton industry of Lancashire resemble each other in many ways. Each is situated on the flanks of the Pennines, on a coalfield and near to a great port. Each owes its origin to the "domestic" manufacture of woollen goods which was carried on in the homes of the people long before the Industrial Revolution. Each owes a great deal to the energy and skill and inventiveness of the masters and workpeople. But, when Lancashire turned to cotton manufacture, Yorkshire stuck to the woollen industry. This was, no doubt, due partly to the fact that Yorkshire is in the rain-shadow of the Pennines, and so has not such a suitable climate for cotton manufacture as Lancashire.

Another reason was that the Yorkshire manufacturers in the early days preferred wool and despised cotton.

The West Riding seems to have some advantage over Lancashire in the fact that it is not entirely dependent on foreign countries for its raw material. But this is not really any great advantage, for only a small part of the wool used in the West Riding is produced in this country. Nearly all of it is imported from such great sheep-

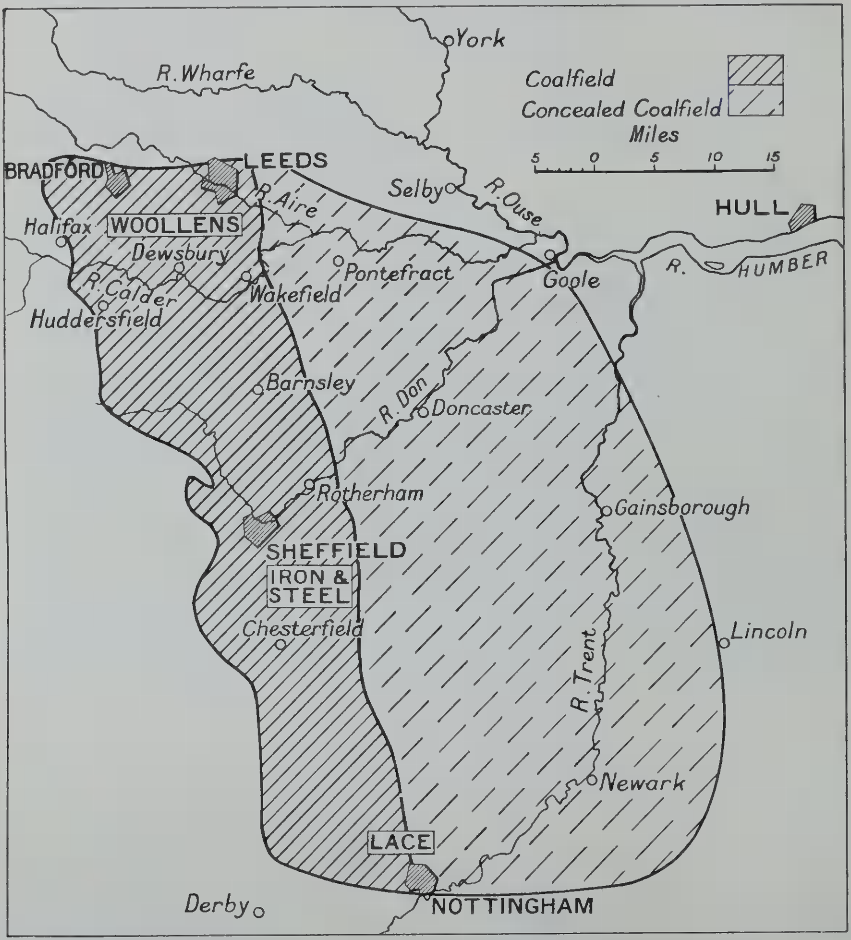
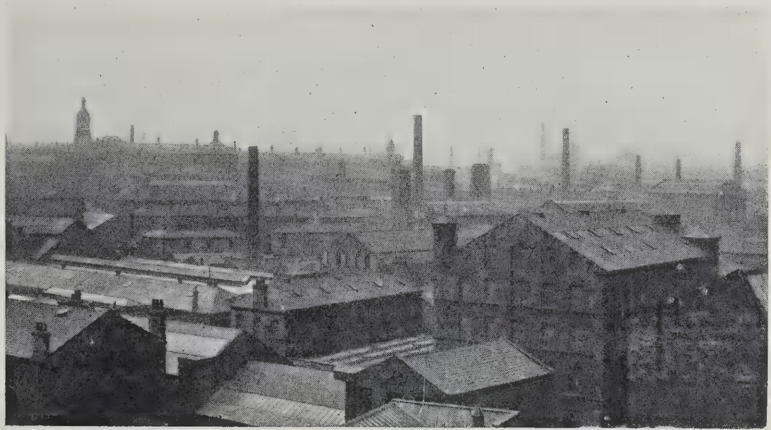


FIG. 28.—THE YORKS, DERBY AND NOTTS COALFIELD

rearing countries as Australia, New Zealand, South Africa and Argentina.

In the manufacture of woollen goods, as in the case of cotton goods, the two principal processes are spinning and weaving. We saw that in Lancashire these two processes are carried on in different districts. In Yorkshire both spinning and weaving are done in the same town and often in the same factory. The chief distinction in the Yorkshire industry is between " worsteds " and " woollens."



(*Topical Press Agency*)

FIG. 29.—FACTORIES IN BRADFORD

(This view was taken during the holiday week—hence the absence of smoke)

" Worsteds " are made from the long, thin fibres of the finest wool, while " woollens " are made from the shorter fibres and poorer qualities of wool. One important branch of the woollen section is the manufacture of " shoddy," which is made from fibre obtained by pulling old rags to pieces.

The northern half of the wool-manufacturing area is chiefly engaged in the worsted industry, while the southern half is noted chiefly for woollens and shoddies.

Bradford is the great marketing town, and its Exchange is as much the centre of the industry as the Manchester

Exchange is of the cotton industry. The city also specialises in the manufacture of worsted and velvet. In addition it has many factories which manufacture cotton and artificial silk goods. (The material from which artificial silk is woven is made from wood-pulp.)

Halifax is specially noted for the manufacture of carpets and blankets. **Huddersfield** is engaged in both woollen and worsted manufactures, and also makes some "shoddy." The chief centres for the latter industry are, however, such smaller towns as *Batley* and *Dewsbury*.

Leeds is not specially important for the manufacture of woollens or worsteds, but it is the greatest centre in the world for the manufacture of ready-made clothing. It has also many other industries, such as engineering, soap-making and the manufacture of boots and shoes.

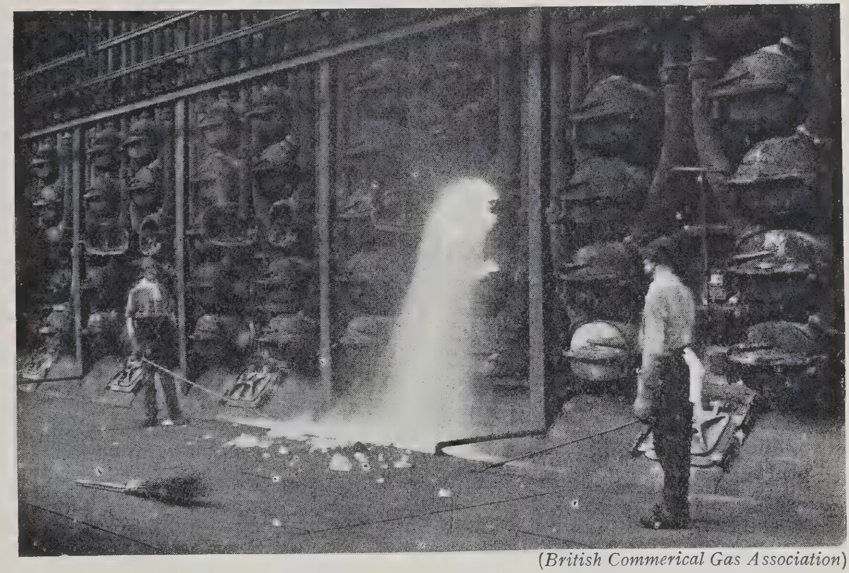
Hull is the great port of Yorkshire, but strange to say, it imports only about a fifth of the wool used in Yorkshire. It specialises in the import of foodstuffs such as wheat and dairy produce, and raw materials such as timber and vegetable oils.

B. The Central Portion of the Coalfield

Very little textile manufacturing is carried on in the central part of the coalfield, though **Barnsley** still manufactures some high-class linen goods.

Sheffield is world-famous for the manufacture of steel and cutlery. The city is situated in a basin-shaped hollow towards the centre of which flow several rapid streams. In the early days of the industry iron ore was mined locally, and smelted with the charcoal from the neighbouring woods. The power of the rapid streams was used for turning grindstones made from local sandstone and for working the bellows and mechanical hammers used in the small workshops. Nowadays all the iron is either imported or brought from other parts of Great Britain, and coal from neighbouring collieries is used for smelting and for running the machinery in the great steel-works which have grown up in the centre of the city.

All the world knows the fine quality of the cutlery and tools produced in Sheffield ; but the city has now other and greater branches of steel manufacture. It produces all kinds of special steel for particular purposes, as well as great steel castings, armour plates and cannon.



(*British Commerical Gas Association*)

FIG. 30.—DISCHARGING RED-HOT COKE FROM THE RETORTS

Rotherham and **Chesterfield** are other iron and steel towns in the vicinity, while **Doncaster,** on the " concealed coalfield," is a coal-mining and engineering centre.

C. THE SOUTHERN PORTION OF THE COALFIELD

Nottingham, which is situated at the southern tip of the coalfield, manufactures lace and hosiery. The industries grew up there chiefly because the first machines used for making these goods were invented in that district.

Those who add to their geographical knowledge by reading labels and advertisements will know that Nottingham also manufactures cycles and has great tobacco and drug factories.

Derby is a town of many industries. It builds locomotives for the L.M. & S. Railway and manufactures lace, gloves, pottery, and paint. It is also famous as the home of the Rolls Royce motor car.

V. THE NORTH-EAST COAST

The coalfield of **Northumberland** and **Durham,** unlike those of Lancashire and Yorkshire, reaches to the coast, and even extends some distance under the sea. In addition, it is crossed by two great rivers, the Tyne and the Wear, while a little to the south of it is a third river, the Tees.

It is not surprising, therefore, that this district exports a good deal of coal. Six hundred years ago coal was being sent by sea from Newcastle to London, where it was known as "sea-cole." In modern times a large fleet of "colliers," as the coal-carrying vessels are called, still keep up this traffic, while many are also engaged in carrying coal to the countries round the Baltic and the Mediterranean.

In spite of the great export trade, the north-eastern district retains ample coal to run great industries. Two raw materials have greatly assisted the growth of these industries. In the **Cleveland Hills** of North Yorkshire there are great deposits of *iron ore*, and in the district between the Wear and the Tees much *salt* is mined. These minerals have given rise to metal working and the manufacture of chemicals and glass.

Nearly all the large towns of this north-eastern district are situated round the estuaries of the great rivers, where they can easily be reached by ocean steamers (see fig. 31).

Iron smelting is carried on chiefly at **Middlesbrough.** A hundred years ago this was a small village with a population of 150; now it is a large town with 138,000 inhabitants.

In the middle of last century it grew so rapidly that it was called a "mushroom town"—a term which suggested that it had grown up overnight!

The reason for the rapid growth was its splendid facilities for smelting iron. Some of the ore is obtained from the near-by Cleveland Hills, though a good deal of iron is now imported from Sweden; coke is obtained from the Northumberland and Durham coalfield; and limestone is quarried on the edge of the Pennines. Besides being an iron-smelting town, Middlesbrough is a great shipbuilding and engineering centre.

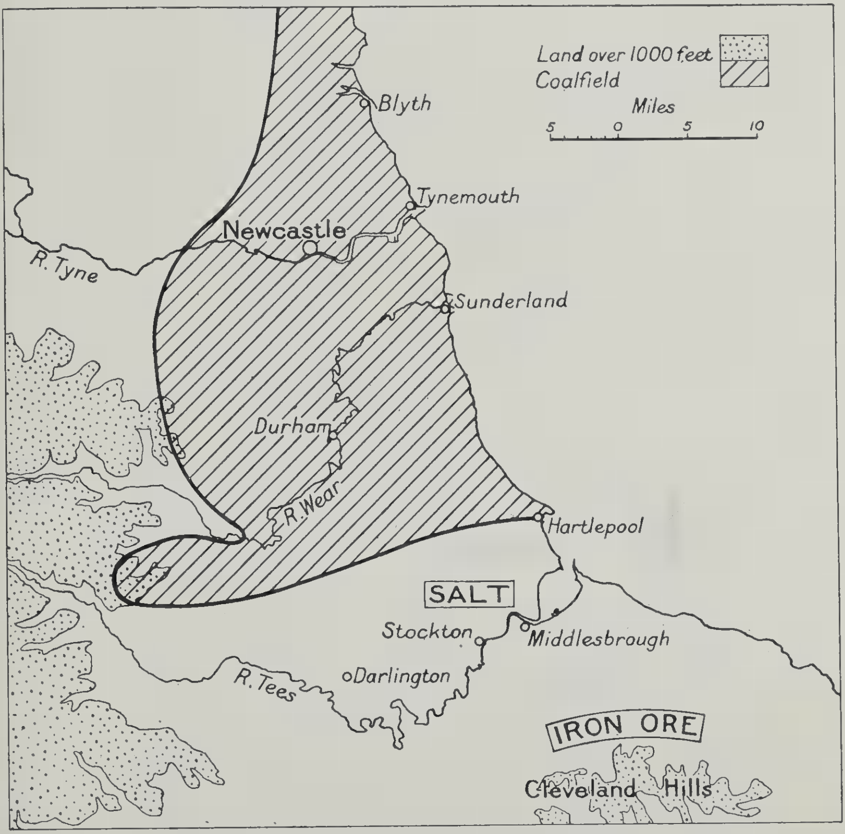
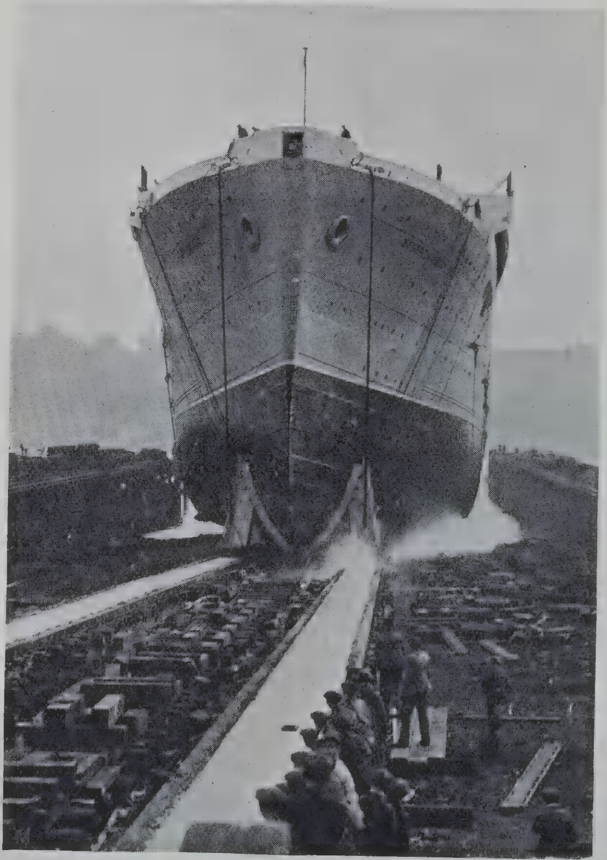


FIG. 31.—THE NORTH-EASTERN INDUSTRIAL AREA

Stockton, on the opposite bank of the Tees, is noted specially for shipbuilding, and for the construction of bridges. The Sydney Harbour bridge is only one of many world-famous steel bridges which have been built by Stockton firms. Near by, too, at Billingham-on-Tees, is one of the world's greatest chemical factories.



(*Central Press*)

FIG. 32.—LAUNCHING A 20,000 TON LINER AT WALKER-ON-TYNE

Hartlepool is a shipbuilding town, and also a fishing port of importance.

Darlington, situated on the Tees, opposite the gateway between the Pennines and the Cleveland Hills, is noted chiefly for railway engineering.

Sunderland, at the mouth of the Wear, is another shipbuilding town. As it is on the coalfield it is also engaged in the export of coal.

Newcastle has become the greatest town of the whole region because it has the finest position. It is at the lowest point on the Tyne where a bridge could easily be built; it is at the highest point which can be reached by ocean steamers; and it controls the route northward into Scotland, and the route westward through the Tyne Gap. The Romans built a fort there to guard the wall which ran through the Tyne Gap, and the Normans built a "New Castle" there to guard the route from Scotland. As we have seen, it became important in very early times for the export of coal; and in modern times it has developed great industries, especially shipbuilding, engineering, and the manufacture of big guns.

EXERCISES

1. Draw a sketch-map to show why Newcastle grew to importance. (Show the high land, the routes, and the coalfield.)

2. Find out the meaning of the terms: broadcloth, flannel, serge, cashmere, alpaca, gabardine.

Find the names of other types of woollen cloth.

3. On a map of Northern England mark the towns which have football teams in the First Division; use other colours to show those which have teams in the Second and Third Divisions.

CHAPTER VI

THE MIDLAND TRIANGLE

If you study a physical map of England and Wales you will see that in the middle of our country the physical features run in threes, thus marking out what is sometimes called the "Midland Triangle."

As shown in fig. 33, the sides of this triangle are formed by the southern end of the Pennines, the Welsh Mountains, and the Cotswold Hills with their continuation, the Northampton Uplands.

Within this triangular framework of high land is another triangle of rivers—the Severn, its tributary the Avon, and the Trent; and at the corners of the triangle are three gateways—the Cheshire Gate, the Trent Gate and the Severn Gate. Even the rocks of the Midland Triangle fall into three groups. There are hard, old rocks, which stand out to form such barren hills as the Charnwood Forest; there are coal-seams which were formed ages ago at a time when the climate was very hot and wet; and there are reddish clays and sandstones which were formed when this region was a desert somewhat like the Sahara of to-day.

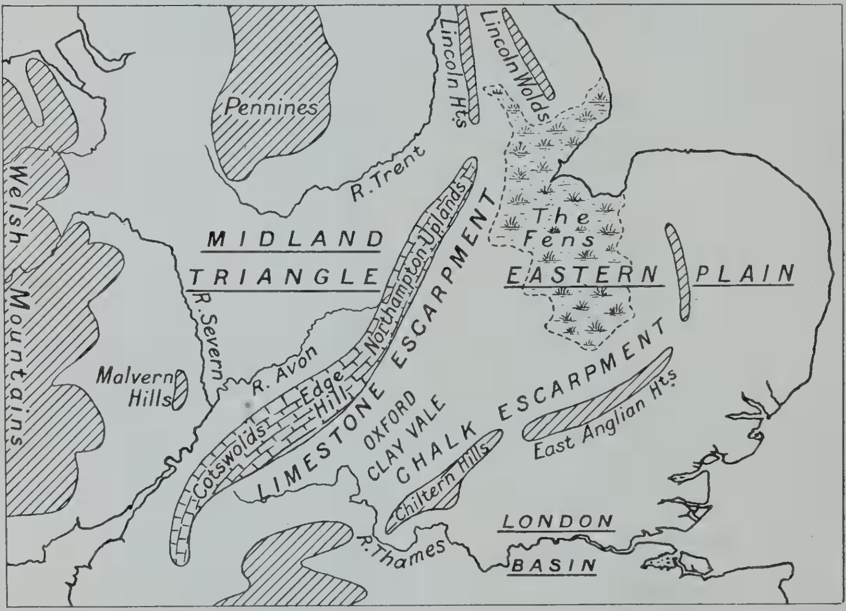


FIG. 33.—THE MIDLAND TRIANGLE AND EASTERN ENGLAND

The work of the people also falls under three chief headings, viz., farming, mining and manufacturing.

Farming.—The climate of the Midland Triangle is intermediate between that of the wetter west and that of the drier east. So, too, the kind of farming carried on is a fair sample of the farming of the country as a whole.

Some districts specially noted for dairy farming are northern Shropshire, the eastern part of Leicestershire, and the part of Warwickshire known as the " Forest " of Arden.

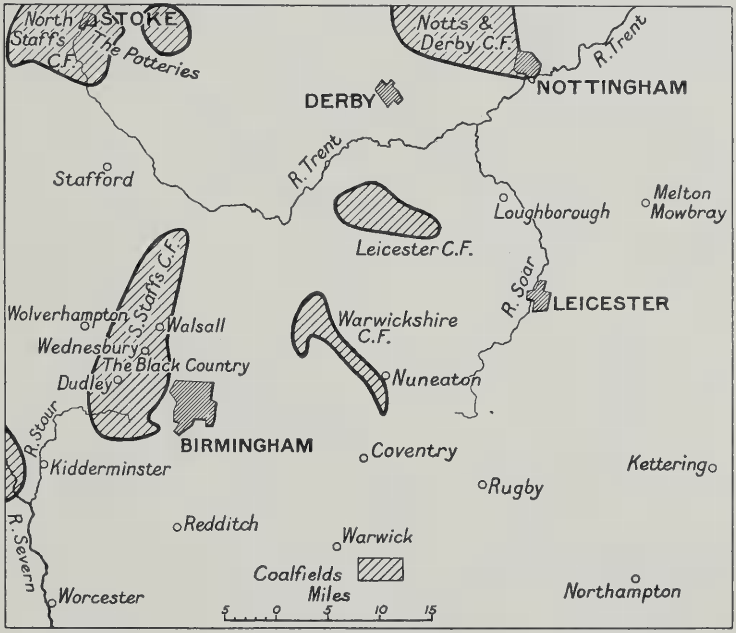


FIG. 34.—THE MIDLAND TRIANGLE. COALFIELDS AND TOWNS

The chief sheep-rearing districts are situated on the sandy lands of the plain, and on the limestone hills such as the Cotswolds.

On the ploughed land the chief crops are oats, barley, wheat, clover, and root crops such as mangolds and turnips.

Fruit growing is specially important in the **Vale of Evesham,** which has light sandy soil and exceptionally warm, sunny weather.

Mining.—The Midlands are rich in both coal and iron.

In the middle of the triangle lie the coalfields of **South Staffordshire** (the 'Black Country'), **Warwickshire** and **Leicestershire** ; on the northern side of the triangle are the **North Staffordshire Coalfield** and the southern tip of the **Yorks, Derby and Notts Coalfield** ; and on the west are the coalfields of the Welsh borders.

Iron-mining is a very important industry in the **Northampton Uplands.** There the iron ore is found in thick layers often only a few feet from the surface. Consequently the ore is usually obtained by quarrying rather than mining.

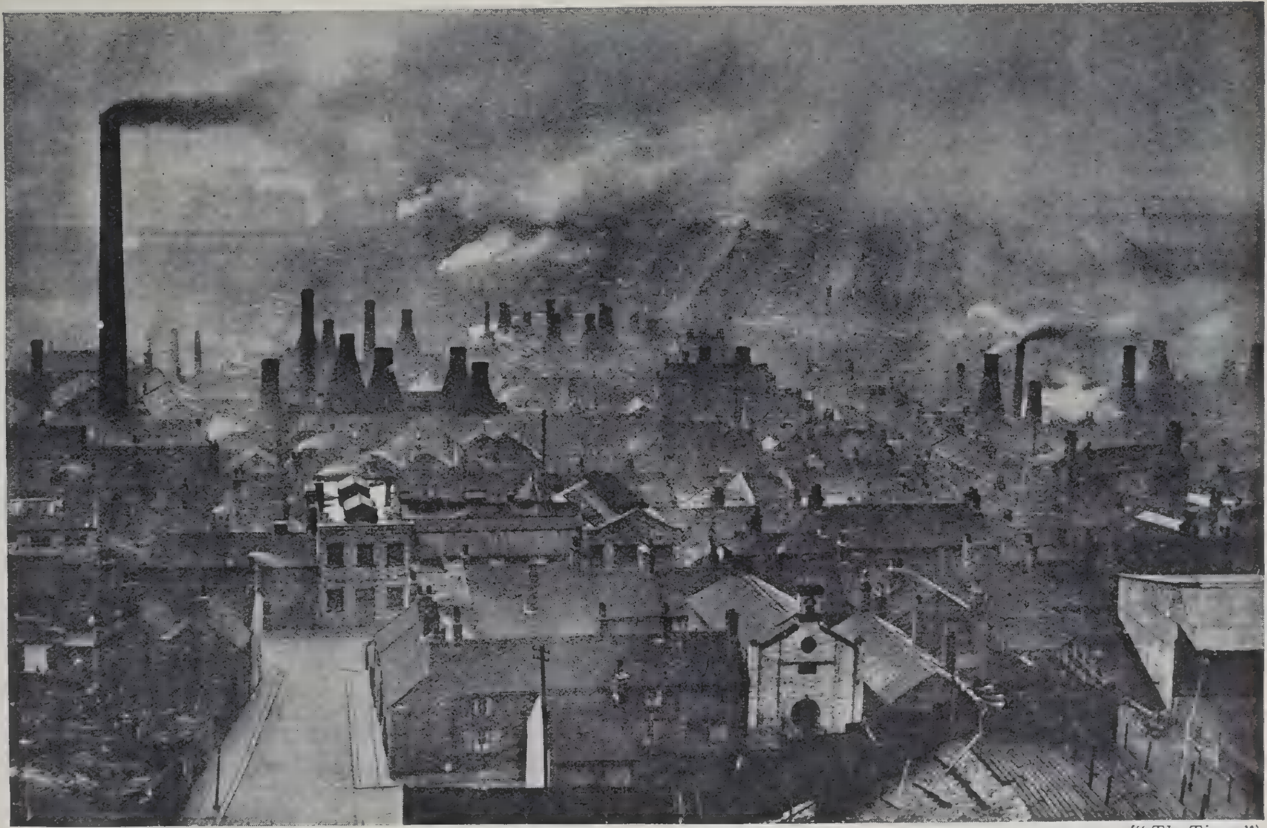
Great developments are now taking place at *Corby*, some 20 miles north of Northampton, where it is planned to mine the ore on a vast scale, and to set up blast furnaces and steel-works to employ many thousands of men.

Manufacturing.—As in most other industrial districts, the chief manufacturing towns are to be found on or near the coalfields. Some of the Midland coalfields, however, are too small to support great industries. These are the Leicestershire, the Warwickshire and the Welsh Border coalfields. On each of the others great industries have grown up. We have already considered the Nottingham district along with northern England, so there remain only the North Staffordshire and the South Staffordshire coalfields.

On the **North Staffordshire Coalfield** the manufacture of various kinds of earthenware and china is so important that the district is often called " The Potteries."

To make pottery, clay is first ground up very fine and mixed with water to make a semi-liquid mass, which is moulded to the required shape. The vessels are then " baked " in kilns and allowed to cool, after which they are glazed and again heated in the kiln.

North Staffordshire is fortunate in having plenty of clay, and plenty of coal for running the machinery and heating the kilns. But the local clay can only be used for making such coarse earthenware as drain pipes and tiles, and for



("*The Times*")

FIG. 35.—IN THE "FIVE TOWNS" (THE POTTERIES)

mixing with finer clays. Many of the materials for the china and porcelain for which the district is so famous have to be brought from afar. The fine white china clay or kaolin comes from Cornwall, special " ball-clay " from Dorset, flint from the coast of Normandy and bone from Argentina.

The modern pottery industry owes its origin and success mainly to one man, Josiah Wedgwood, " the father of English pottery," who made Wedgwood ware known the world over.

The central part of the " Potteries " used to be known as " The Five Towns." These were so close together that they eventually joined to form one city—**Stoke-on-Trent.**

THE BLACK COUNTRY

Long ago, when iron ore was smelted with charcoal, South Staffordshire was noted for ironwork, and Birmingham for the excellent metal-ware turned out by its blacksmiths. It was, however, after the Industrial Revolution that the Black Country earned its name. Great quantities of coal and iron were mined, often from the same pits, and so many furnaces were built that the district became " a great workshop both above ground and below." At night it was livid with the flames of iron furnaces, and by day it appeared " one vast loosely-knit town of humble homes amid cinder heaps and fields stripped of vegetation by smoke and fumes."[1]

Nowadays a great many of the coal pits and most of the blast furnaces have ceased working, so the Black Country is not nearly so " black " as its name suggests. It remains, however, one of the greatest centres in the world for the manufacture of all kinds of iron and steel goods, " from a pin to a railway engine."

Birmingham, though not in Staffordshire, and neither on the coalfield nor in the real " Black Country," is the largest city of the region, and is, indeed, sometimes called " The

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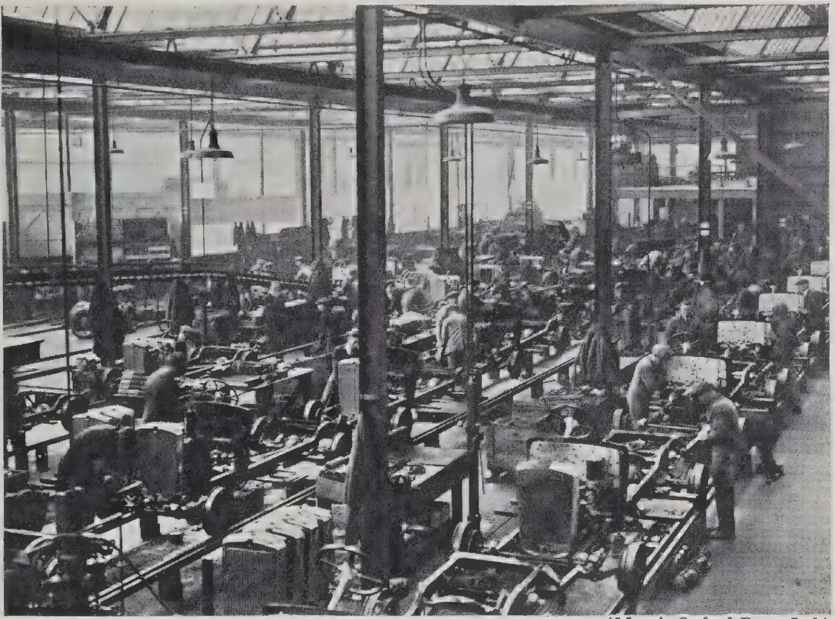
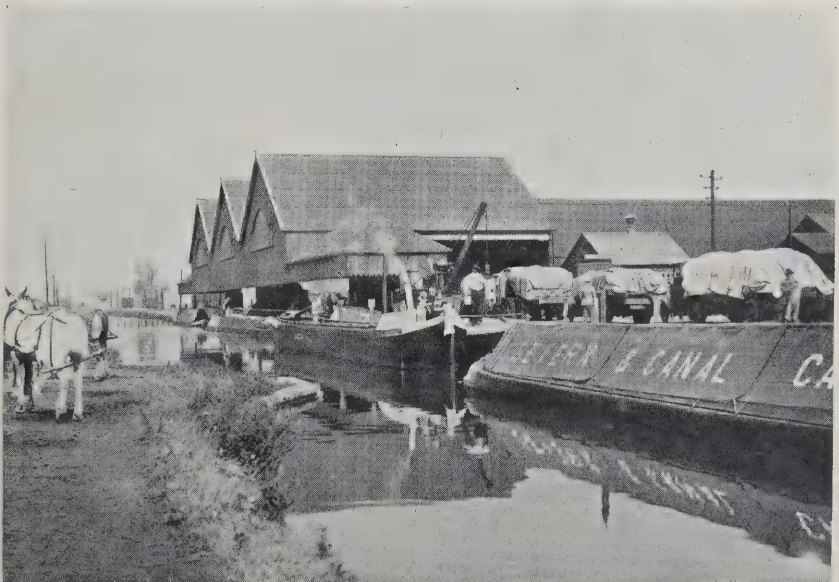
[1] Mackinder.



(*Morris Oxford Press Ltd.*)

FIG. 36.—SCENE IN A MOTOR CAR FACTORY



(*Cadbury Bros.*)

FIG. 37.—PART OF THE CANAL WHARF AT BOURNVILLE, NEAR BIRMINGHAM

Metropolis of the Midlands." It is still a great centre for the manufacture of all kinds of hardware, but in recent years has become known more for its motors, cycles, wireless apparatus and jewellery.

On the coalfield itself there are many busy industrial towns, each of which specialises in some branches of metal working.

Wolverhampton, sometimes called the Capital of the Black Country, has great engineering industries, and also manufactures motor cars and cycles.

West Bromwich specialises in domestic ironmongery and in the making of balances.

Walsall has long been famous for saddlery and harness, and now has a great industry in the upholstering of cars.

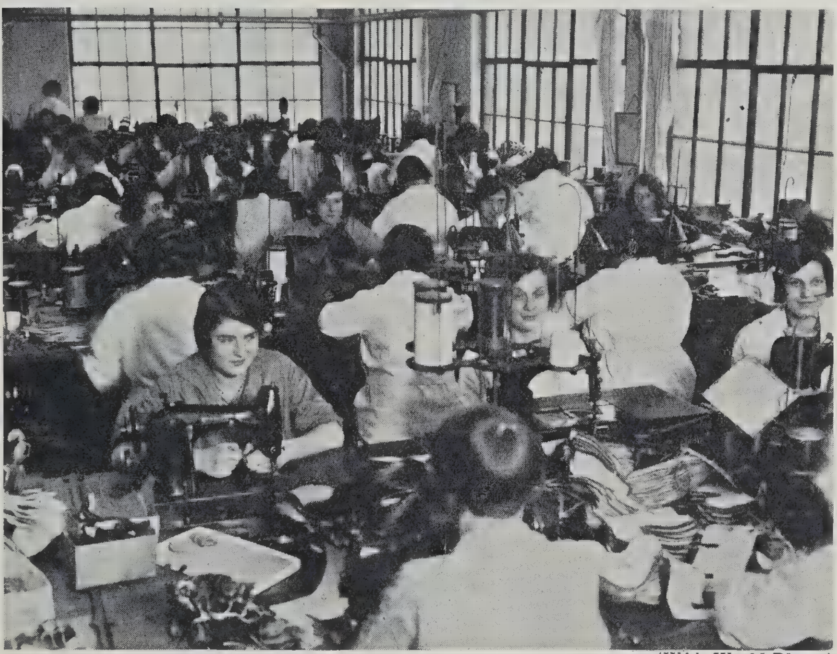
OTHER INDUSTRIAL CENTRES

In the Midlands there are several busy manufacturing towns which are not situated on a coalfield. **Leicester** is the largest of these. It is situated at the foot of the limestone hills which form the south-eastern edge of the Midland Triangle, and has become a great railway centre. Its chief industries are the manufacture of woollen hosiery and boots and shoes. Strange as it may seem, both industries owe their origin partly to the kinds of soil in the locality. The limestone hills to the south afford excellent sheep pastures, and the wool from the Leicester breed of sheep is of such good quality that a woollen industry sprang up in very early times. On the plains around Leicester are good clay lands which provide rich pastures for cattle. From very early times locally tanned leather has been used for making boots and shoes, and now Leicester is one of the world's chief centres of this industry.

By far the greater part of the wool and the leather used in these industries has now to be imported, but Leicester has been able to maintain the lead she established long ago.

Northampton, though not strictly speaking within the Midland Triangle, belongs to the Midland group of towns. Like Leicester it specialises in the manufacture of boots and shoes.

Stafford, situated midway between the Potteries and the Black Country, does not share much in the industries of either region, but is chiefly noted for the manufacture of boots and shoes.



(*Wide World Photos*)

FIG. 38.—IN A LEICESTER SHOE FACTORY

Rugby, like Leicester, is situated at the foot of the limestone ridge. Before the days of railways it was a little market town known only for its school. After the main line of railway from Birmingham to London was built through it, industries began to develop and now it is an important engineering centre.

Coventry, situated between Rugby and Birmingham, is one of the chief centres for the manufacture of motor cars.

EXERCISES

1. Find from advertisements, etc., the towns in which there are motor-car factories. Mark and name these towns on a map of England.

2. Find out what you can about the following men, who did much to establish the industries of the Midlands: Josiah Wedgwood, Abraham Darby, John Wilkinson (born 1728).

3. Draw a sketch-map to show the route by which china clay is taken from Cornwall to North Staffordshire.

4. Draw a sketch-map to show the distances, as the crow flies, from Birmingham to Liverpool, Hull, Bristol and London.

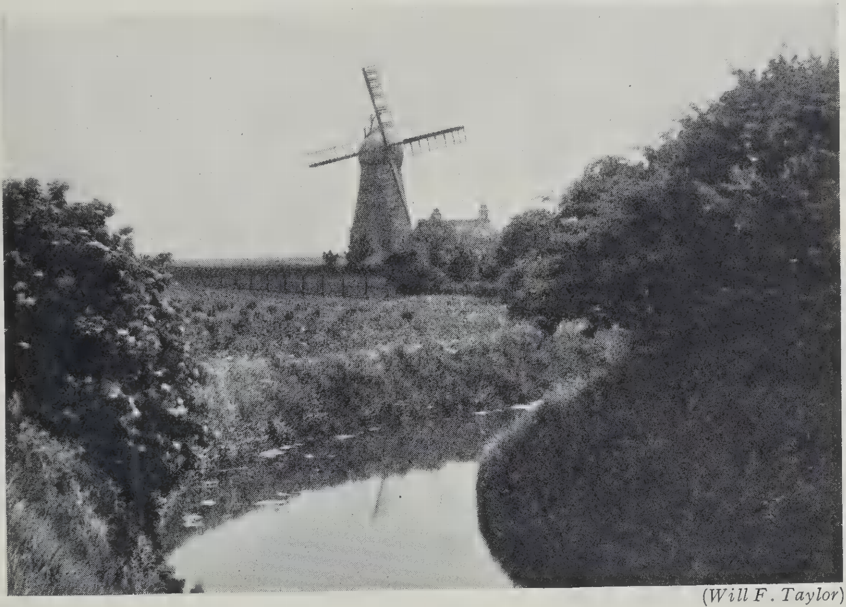
CHAPTER VII

EASTERN ENGLAND

This region is the plain which lies between the Humber and the Thames. Though there are few parts where the land rises above the 600 ft. level, the plain is crossed by two ranges of hills—the *Limestone Escarpment* which forms the Northampton Uplands and the Lincoln Heights, and the *Chalk Escarpment* which forms the Chiltern Hills, the East Anglian Heights and the Lincoln Wolds.

Between these two ridges, and around the broad, shallow bay known as the Wash, is the **Fen District.** Those who remember the story of Hereward the Wake will know that formerly this region was composed of swamp and marsh, with here and there an island of firm ground, such as the Isle of Ely. In the seventeenth and eighteenth centuries the land was drained by the construction of ditches and canals to lead the water to river and sea. Where the rivers enter the sea, sluice gates are fitted; these open automatically at low tide and let the river water out, but when the tide rises the gates close and so prevent the sea water flooding the land.

When the Fenland was drained it was found to be wonderfully fertile, and is now one of the most carefully cultivated parts of the country. Though many people dislike the monotony of the level land, the district has a charm of its own, quite unlike that of any other part of England. It is, indeed, in many ways more like Holland than England. "The artificial drainage, the windmills, the embankments, the pastures, all have a Dutch appearance. Spalding, Boston and Wisbech in many respects resemble Dutch towns. The straight, embanked Welland, with grassy margins and trees on either side, runs through Spalding just as the canals and rivers do in many a Dutch city." [1]



(*Will F. Taylor*)

FIG. 39.—DYKE AND MILL AT SALTFLEET, LINCOLNSHIRE

Eastern England as a whole is the chief farming district in Britain. The reasons for this can be clearly seen when we study different kinds of maps. The physical map shows us that it is the largest area of nearly level ground ; this makes farm work, such as ploughing and harvesting, much easier than on hilly land. A map of the soils shows us that, in addition to the peat and silt of the Fenland, there are fertile clay lands, and chalk and limestone hills which in many places are covered with a fair depth of good soil. The rainfall map shows us that this region is the driest part of England—the reason being that the westerly winds have been robbed of their moisture by the high lands of the west, so that eastern England is in the *rain-shadow*. Other maps would show us that the district has far more sunshine than the average for Britain, especially in late summer and autumn.

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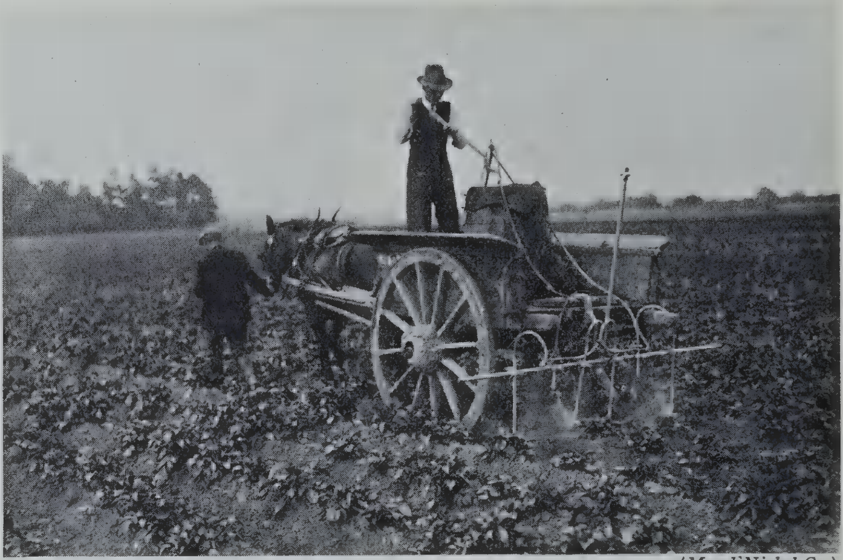
[1] J. Bygott, *Eastern England*.



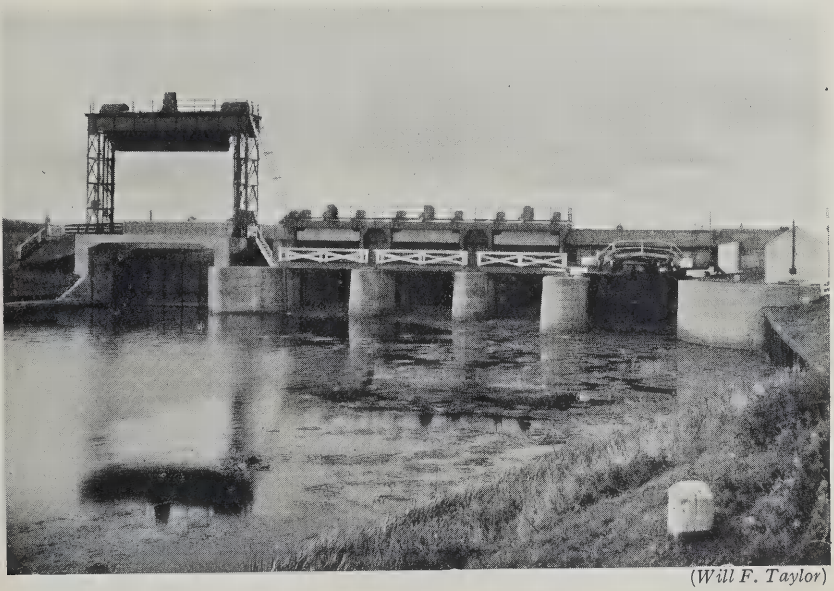
(*Mond Nickel Co.*)

FIG. 40.—THE FEN DISTRICT. SPRAYING POTATOES WITH SULPHATE OF COPPER

Arable farming is conducted on the " rotation " system which was introduced by Coke and Townshend early in the eighteenth century, but the crops cultivated vary a good deal from place to place. Far more wheat is grown in eastern England than in any other part of Britain.

Wheat does best in those areas where the soil is deep and heavy, while barley is better suited to shallower and lighter soils. Turnips are widely grown as food for sheep, which manure the ground ready for the next crop of wheat. In recent years the cultivation of sugar beet has become an important industry.

Market gardening is the chief industry in the Fenlands around Boston, Spalding and Wisbech. Potatoes are the chief crop, but the cultivation of tulips and other bulbs is very important around Spalding, while Norfolk is one of the chief counties for the production of small fruits.

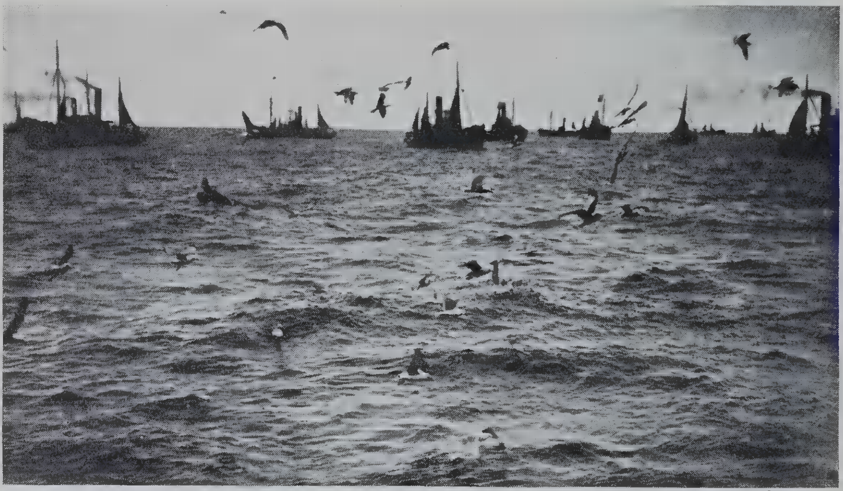


(*Will F. Taylor*)

FIG. 41.—DENVER SLUICE GATES ON THE RIVER OUSE—THE MAIN CONTROL OF THE FEN DRAINAGE

Dairy farming is carried on chiefly in the districts near enough to send fresh milk daily to London and other cities. A good deal of land in Essex and other counties which was once used for wheat growing is now in dairy farms.

The Fishing Industry.—Some of the greatest fishing ports in the world—Grimsby, Yarmouth and Lowestoft—are situated in eastern England. Fish live on tiny organisms which are most plentiful in shallow, rather muddy seas. Consequently the North Sea, which is almost everywhere less than 600 ft. deep, and in many places less than 60 ft. deep, is a great feeding " ground " for fish, and provides nearly three-quarters of the total value of fish landed in the British Isles.



(*Topical*)

FIG. 42.—HERRING FISHING FLEET OFF DOGGER BANK

The herring fishing season starts in May off the coasts of Ireland and northern Scotland ; in September the fish are most numerous off the coast of Yorkshire ; in November other shoals are to be found off East Anglia, and in December the season ends in the Straits of Dover. The fishing fleets visit these areas in turn, so that they are kept busy for the greater part of the year.

The fishing boats are known as herring *drifters* because of the way in which the nets are allowed to drift with the wind and tide. " Steam and the facilities of steam have increased the catching power of drifters, and each carries about two miles of nets. On a normal October night the nets of the drifters which fish from Yarmouth and Lowestoft would, if set end to end, span the Atlantic."

Only a small proportion of the hundreds of millions of herrings landed at our ports every year are sold as fresh fish. Most of them are preserved, some by smoking, in which case they are known as kippers, but most of them by salting. The salted fish are exported in vast quantities to Russia, Germany and southern Europe.

Yarmouth and **Lowestoft** are the greatest herring ports in the world. In November their quays are crowded with Scottish fisher-girls, who are kept busy hour after hour gutting and packing the fish which are landed from the drifters.

Cod and haddock, unlike the herring, feed near the bottom of the sea. They cannot, therefore, be caught by drift nets, which are always suspended near the surface. Instead, lines carrying innumerable baited hooks are used. Plaice and soles are also bottom fish, but they are caught by means of " trawls "—nets shaped like great bags which are attached to lines and dragged along the bottom of the sea. The trawlers often stay at sea several weeks at a time, the catch being taken ashore at frequent intervals by rapid motor-driven boats.

Manufacturing in Eastern England.—Though eastern England is entirely lacking in coal, several of its towns have important manufacturing industries, most of which are connected in one way or another with agriculture. Thus the engineering industries of Lincoln, Grantham, Peterborough and Norwich have grown out of the local need for agricultural implements. A very great variety of machines are, however, now manufactured in these and other towns. Here is a list given by a recent writer (A. Wilmore) : road tractors, road rollers, refuse carts, portable engines, steam rail-coaches, cranes, steam-boilers, steam-navvies and other excavating machinery.

Among the industries depending directly on the produce of the farm lands, we should note the preparation of *mustard* at Norwich, from seed which is grown in Norfolk and neighbouring counties ; *jam-making* at Histon (Cambridgeshire), and the manufacture of *beet sugar* at Cantley, near Norwich.

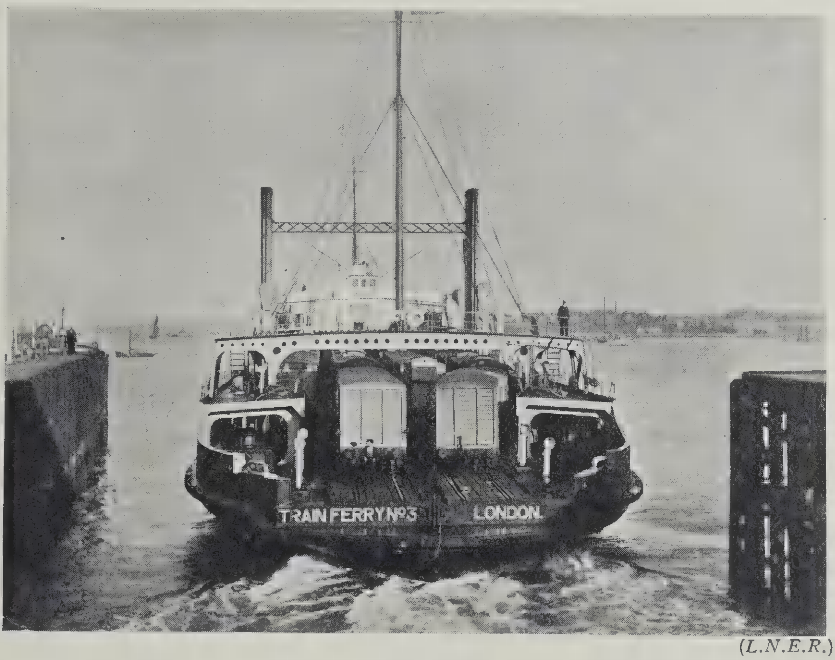
THE TOWNS OF EASTERN ENGLAND

Grimsby, situated on the southern side of the Humber, is an important fishing station, and one of the chief ports for the export of coal from the Yorkshire coalfield. Its chief imports are pit-props from Scandinavia and dairy produce from Denmark. **Immingham,** near by, is a new port which specialises in the shipment of coal. **Lincoln** overlooks the gap by which the Witham flows through the limestone Heights. In Roman times it was an important military station on the road which followed the crest of the Heights, and was also at the head of navigation of the Witham. In modern times it has become the centre

(*W. G. Taylor, Esq.*)

FIG. 43.—SCENE ON THE BROADS

of the roads and railways which naturally make for the gap through the hills. The development of an engineering industry has been helped by the rich deposits of iron ore at Scunthorpe, some miles farther north. Its modern speciality is the manufacture of colliery equipment and excavating machinery.



(*L.N.E.R.*)

FIG. 44.—TRAIN FERRY LEAVING HARWICH

Each of the great rivers flowing into the Wash has a town near its mouth. All these were formerly important ports, but now only the two outer ones, **Boston** and **King's Lynn,** can be reached by ocean steamers. **Spalding** on the Welland, **St. Ives** on the Great Ouse, and **Cambridge** on the Cam, a tributary of the Ouse, all grew up at the farthest point upstream to which the small ships used in Anglo-Saxon times could penetrate.

Norwich is the capital and chief manufacturing centre of Norfolk. **Yarmouth,** the great fishing port, is situated on a sand-spit which nearly choked up the mouths of the rivers Yare and Bure. So much sand and mud have been deposited there that the rivers have been dammed up to such an extent that in many places they swell out into lakes. These picturesque "Broads," as they are termed, are favourite resorts for those who like a yachting or fishing holiday.

Ipswich, the county town of Suffolk, is situated at the head of the estuary of the Orwell. As a port it has given place to **Harwich,** an important packet station situated on a peninsula at the end of the combined estuary of the Orwell and the Stour. From Harwich passenger steamers and train-ferries run to Zeebrugge in Belgium.

EXERCISES

1. In 1931 Bedfordshire had 24,000 acres under wheat. while Cheshire had 8,000 acres under the same crop.

(*a*) Trace the outlines of these counties, and in each put one dot for every 1,000 acres of wheat land.

(*b*) Account for the difference shown in your map.

2. The following table shows the total values of various kinds of fish landed in the British Isles in 1930.

Draw fishes proportional in length to these values.

Type of fish	Cod.	Haddock.	Herring.	Plaice.	Hake.
Value	£3,500,000	£2,800,000	£2,100,000	£1,500,000	£1,500,000

CHAPTER VIII

WALES AND THE SEVERN BASIN

When we compare a political map with a physical map we see that the boundary between England and Wales follows fairly closely the edge of the high land. If we would find the reason for this we must go back fifteen hundred years, to the time when the Anglo-Saxons were conquering Britain. On the lowlands the Britons could not withstand them, but they were able to hold their own in the mountainous district of the west. Possibly, too, the barren mountains did not seem to the Anglo-Saxons to be worth fighting for. Consequently Wales remained for many centuries an independent country, its boundary with England being roughly the edge of the high land.

Though the mountains helped the Welsh to keep their independence for so long, they are really a very great hindrance to the prosperity of the Principality. The only kind of farming that can be done on the bleak and rocky mountain sides is sheep rearing ; but the pastures are so poor that each flock of sheep requires a very large area on which to feed. In the valleys some cattle rearing and dairy farming are carried on, but the " markets " (*i.e.* large towns) are so far away that it is difficult for the farmers to make a profit. In some places, too, there are small factories which make such products as Welsh flannel, but such factories have found it very difficult to compete with the mills of the West Riding of Yorkshire, and most of them have had to close down.

It is not surprising, therefore, that nearly the whole of Wales is very thinly peopled. The only parts where there are many towns and villages are near the north and south coasts. On the north coast most of the towns owe their prosperity to holiday makers. The railway which runs along the coast from Chester to the Menai Bridge, and then across Anglesea to Holyhead, makes it easy for people in the crowded manufacturing districts of the Midlands and the North to get to such well-known seaside resorts as Rhyl, Colwyn Bay and Llandudno. Much of the popularity of these holiday places is due to the fact that they are within easy reach of the Snowdon range, with its magnificent peaks, deep valleys and beautiful lakes.

Apart from catering for tourists and holiday makers, the chief industry of North Wales is quarrying. In several districts the rocks have been so compressed by the forces which built the mountains that slate has been formed. Some of the biggest slate quarries in the world are to be seen at Penrhyn and Llanberis.

In other places where hard crystalline rocks, such as granite, crop out near the sea or by a railway, there are huge quarries from which granite setts and chips for road metal are sent all over the country.

On the eastern border of North Wales is a coalfield which stretches through the counties of Flint and Denbigh. Though this coalfield seems fairly important on the map, it does not produce a great deal of coal, and does not support any great industry. The chief towns on the coalfield are Ruabon and Wrexham.

THE RAILWAYS OF WALES

It is interesting to follow the course of the Welsh railways on a physical map and see how they all follow the "grain of the land."

Trace the following important routes, noting carefully how they make use of natural gateways :

(1) Along the northern coastal plain, from Chester to Holyhead.

(2) From Ruabon, *via* Bala to Barmouth.

(3) From Shrewsbury, up the Severn Valley to Aberystwyth on the shores of Cardigan Bay.

(4) From Shrewsbury, across the middle of Radnor, Brecknock and Carmarthen, to the town of Carmarthen.

(5) Along the southern coastal plain through Newport, Cardiff and Swansea to Fishguard on the coast of Pembroke.

SOUTH WALES

The South Wales coalfield is specially noted for the export of coal. This is partly because the coal is mined in valleys

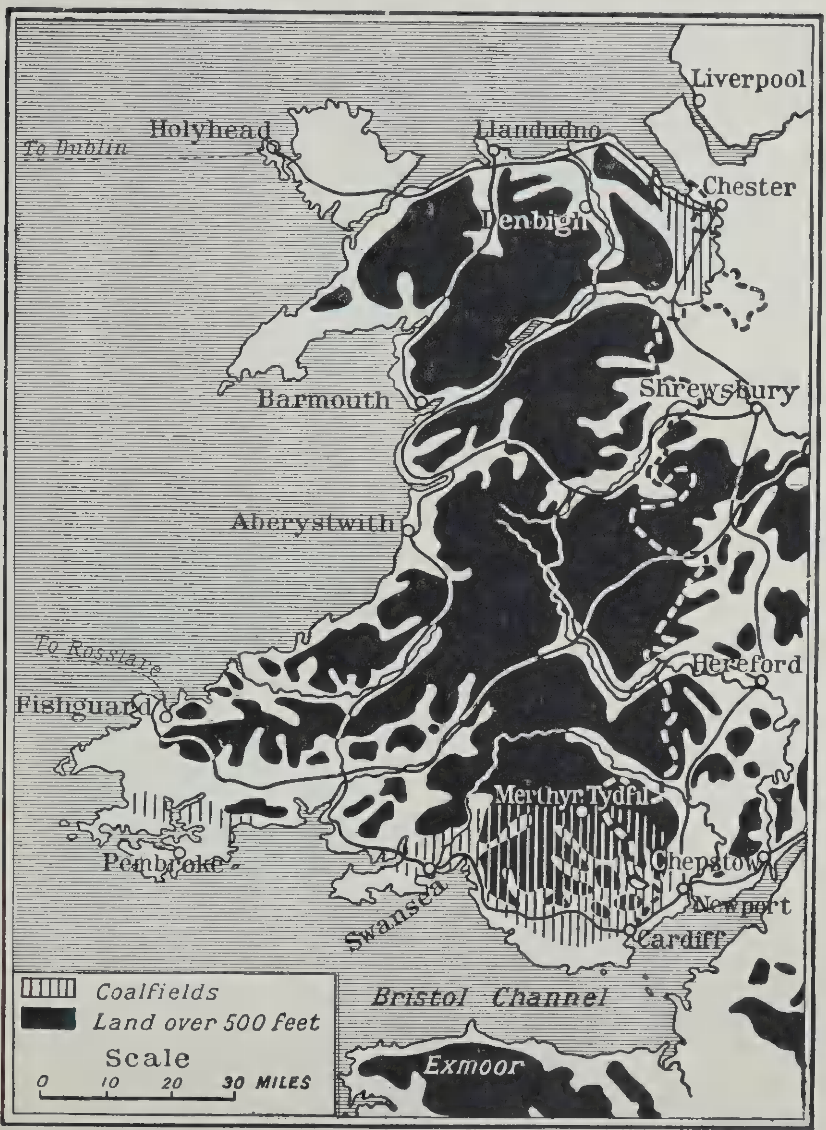


FIG. 45.—WALES. PHYSICAL

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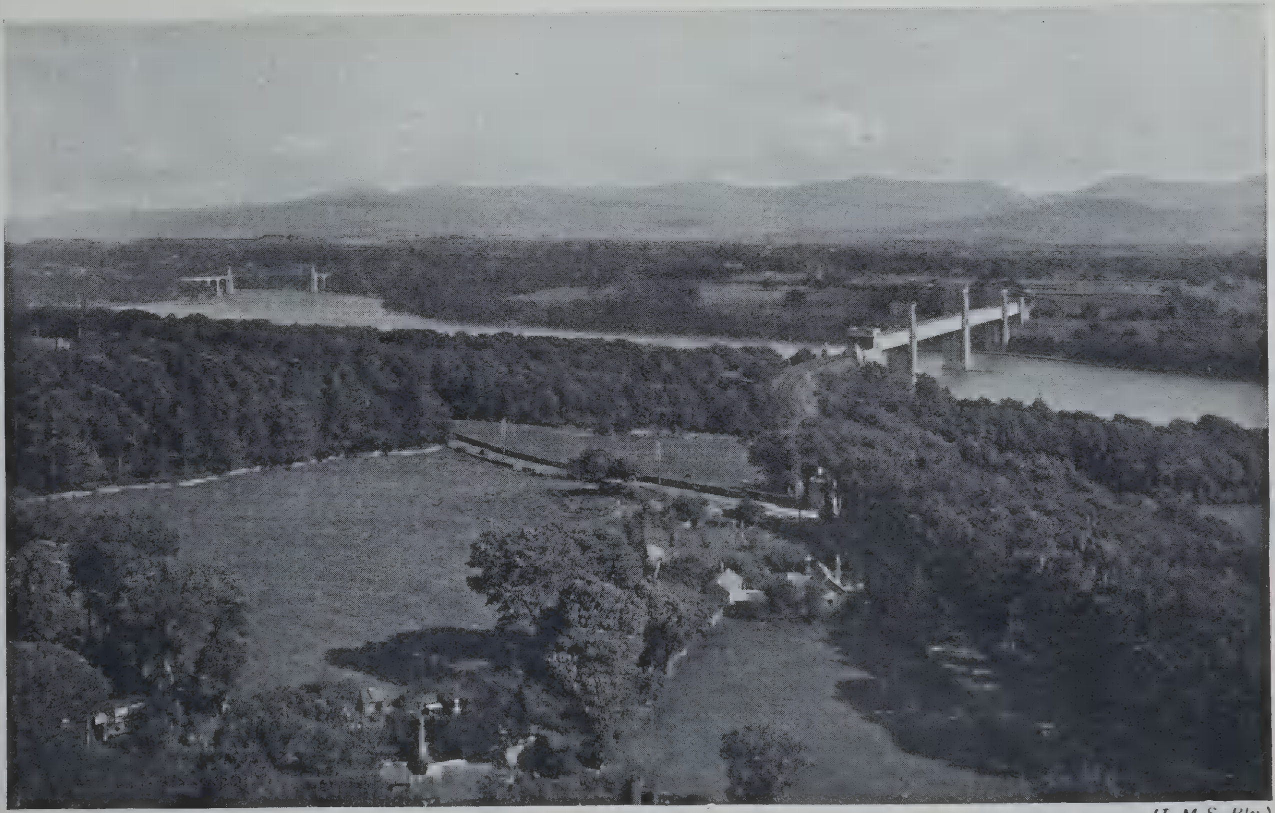


(*L.M.S. Rly.*)

FIG. 46.—MENAI STRAITS

which lead down to the sea, and partly because it is of very good quality. The best coal of all, known as *anthracite*, is mined in the western part of the coalfield. It burns without flame and without smoke, although giving off great heat. *Welsh steam coal* is almost as good as anthracite and is largely used by both British and foreign steamships. In recent years, however, many steamers, including British warships, have begun to burn oil, and this has caused great loss to South Wales.

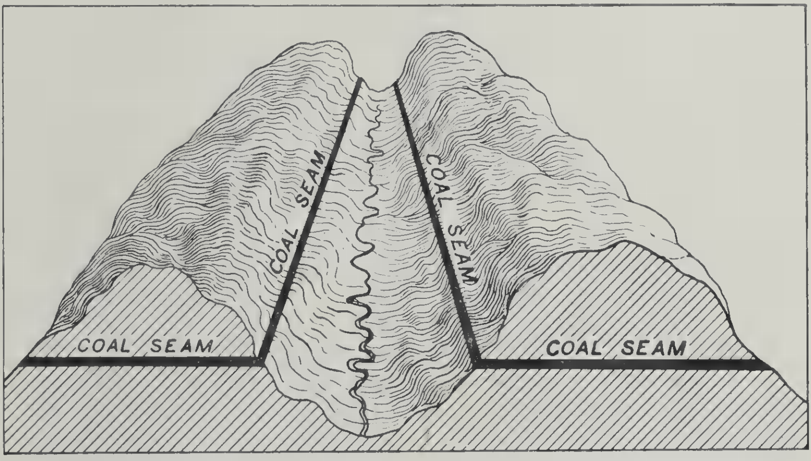


FIG. 47.—BLOCK DIAGRAM OF A SOUTH WALES VALLEY

Fig. 47 shows how the coal-seams " outcrop " in the deep, narrow valleys. A good deal of it is mined by *adits*, or nearly horizontal shafts driven into the hillsides. The miners' cottages are arranged in long, dismal rows near the bottoms of the valleys, and each thickly peopled valley is separated from the next by rugged moorlands.

We have seen that coalfields generally become great manufacturing areas, and South Wales is no exception to this rule. It specialises in the manufacture of various kinds of metal goods, the chief of which is tin-plate.

The " tin " of which tin-cans are made is not mainly composed of tin ; it is a thin sheet of iron coated with a

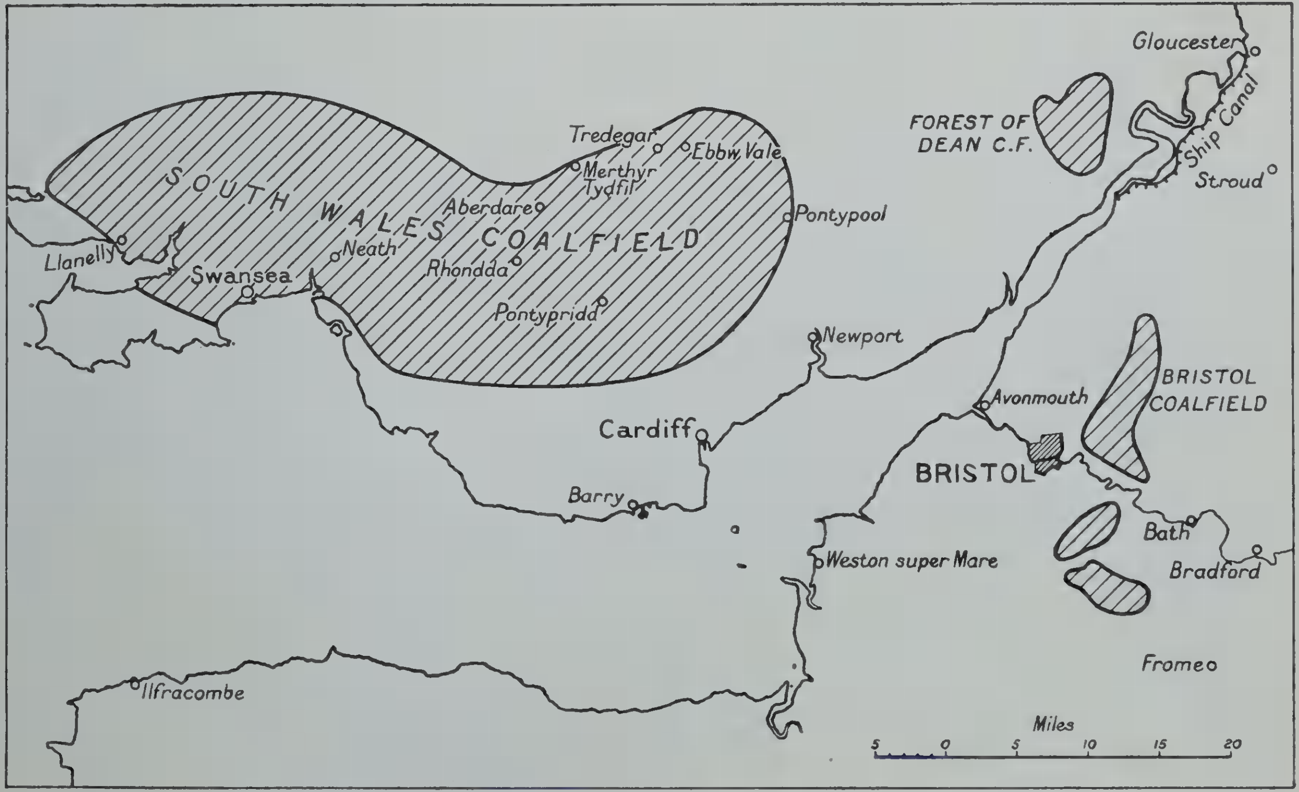
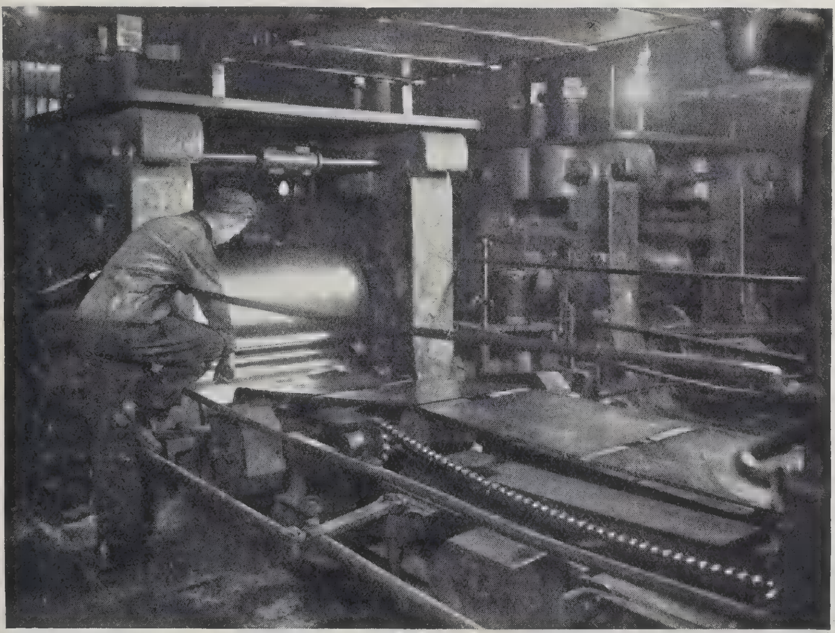


FIG. 48.—SOUTH WALES COALFIELD AND THE BRISTOL CHANNEL

very thin film of tin. South Wales was formerly rich in iron ore, and tin was obtained from Cornwall, so it is not surprising that the manufacture of tin-plate grew up at the Welsh ports where ores and coal could be easily obtained. Nowadays, however, most of the iron ore is brought from Spain and Algeria, while the tin comes from Bolivia, the Malay States, Java and other countries.

THE TOWNS OF SOUTH WALES

Each of the big towns of South Wales is situated on an estuary at the lowest place where the river could be bridged and the highest point which could be reached by sea-going vessels.



(*Gooch*)

FIG. 49.—TIN-PLATE FACTORY, SOUTH WALES

Cardiff grew up round a Norman castle which guarded the point where the route from England to Ireland crossed the river Taff. It manufactures tin-plate, exports metal goods and coal, and imports great quantities of foodstuffs for the densely peopled district around.

Swansea is the chief centre for the manufacture of tin-plate, and is also one of the greatest copper-refining towns in the whole world. Near by is a great oil depot, where petroleum is stored and refined.

Fishguard is the terminus of the Great Western line of railway which passes under the Severn by a tunnel 4½ miles long, and links up all the coastal towns of South Wales. From Fishguard fast steamers ply to Rosslare at the south-western corner of Wales.

THE SEVERN BASIN

The Severn, which is the longest river in Great Britain, rises in Plynlimmon, only 15 miles from Cardigan Bay. For the first 50 miles of its course it flows north-eastward through a deep valley, in which lie such small market towns as Newtown, Montgomery and Welshpool. After crossing the border into England it flows over the broad plain of Shropshire to Shrewsbury, and then turns southward and enters the Severn Gorge at Ironbridge. The lower half of its course is through the fertile plains of Worcester and Gloucester. Its chief tributary is the Warwickshire Avon, which drains the fruitful Vale of Evesham. The Wye, which drains the plain of Hereford, is sometimes reckoned as a tributary of the Severn, but the Bristol Avon, which flows into the estuary a little nearer the open sea, is always regarded as a separate river.

Though the greater part of the Severn Basin is a fertile agricultural lowland, it contains several small coalfields, which have given rise to manufacturing industries.

Near the mouth of Severn are two small coalfields—the **Forest of Dean** to the north of the estuary, and the **Bristol** coalfield to the south. The scenery in the former area is very different from that in most coalfields. In place of smoky towns and great spoil-heaps, there are beautiful woodlands dotted with villages. The reason is that most of the coal mines are very small. Indeed, the colliers often own their own mines, for a native of the district " who has worked in a coal-mine for a year and a day, becomes a ' free miner,' and has an exclusive right to work coal in any part of the Forest which is not already occupied by other miners."[1]

The coal from the Bristol coalfield is largely used in the near-by " West of England " woollen district. The industry grew up in such towns as Stroud, Trowbridge and Bradford, because of the local water power, and the excellent wool obtained from the sheep of the Cotswolds. These towns have long been famous for " broadcloth " and good quality suitings, but now specialise also in cloths for liveries, billiard tables and tennis balls.

Bristol is the chief city of the region, and one of the chief ports of the British Isles. It was of great importance in the early days of trade with America, but suffered a great deal when ships became too large to get through the gorge which separates it from the sea. In modern times, however, the outport of Avonmouth has enabled it to regain some of its earlier importance.

It still trades chiefly with America, and its chief industries have arisen from that trade. It is a great sugar-refining and tobacco-preparing centre, and is also well known for the manufacture of chocolate and cocoa.

Bath, also situated on the river Avon, owes its growth to its warm springs. The Roman bath, which is one of the most interesting features of the city, is one of the finest of its kind in the world.

Gloucester, at the head of the Severn estuary, seems to have great advantages as a port ; but it suffers from the fact that it cannot be reached by large vessels. A ship-canal has been constructed from Sharpness, but even this can only take small steamers; consequently the traffic to and from the Midlands is largely conducted through other ports.

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[1] A. Wilmore.

Newport, like its "sister" ports Cardiff and Swansea, is engaged chiefly in the export of coal and in metal manufacturing.

EXERCISES

1. Think of any incidents in history which illustrate the advantages and disadvantages of the mountainous character of Wales.

2. Find out what you can about (*a*) the Welsh Eisteddfods, (*b*) Lake Vyrnwy, (*c*) the song "Land of my Fathers."

3. Write the autobiography of a tin-can.

4. Pembroke is only one and a half times the size of Radnor, but it has three times as many cattle. Radnor has, however, more than twice as many sheep as Pembroke.

Account for these differences.

CHAPTER IX

THE SOUTH-WESTERN PENINSULA

MAPS should bring pictures to the "eyes of the mind." Here is a hotch-potch of subjects which a map of the South-Western peninsula suggests to those who know that region—red deer, prisons, orchards, Cheddar cheese, Devonshire cream, daffodils, fishing boats, granite, rocky headlands, sandy coves, white clay, red soil, tin mines. Those who live, or have lived in the district would, no doubt, make the list very much longer. But we have mentioned sufficient subjects to make it clear that the South-Western Peninsula is a land of great variety. The physical map shows us why this is so. Highlands and lowlands are mixed up in a way hardly equalled in any other part of Britain. Moreover, there are several different kinds of rock in both the highlands

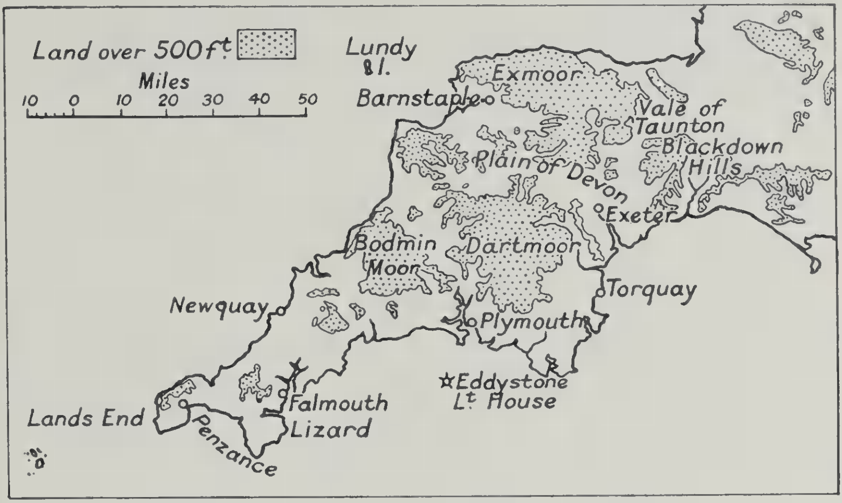
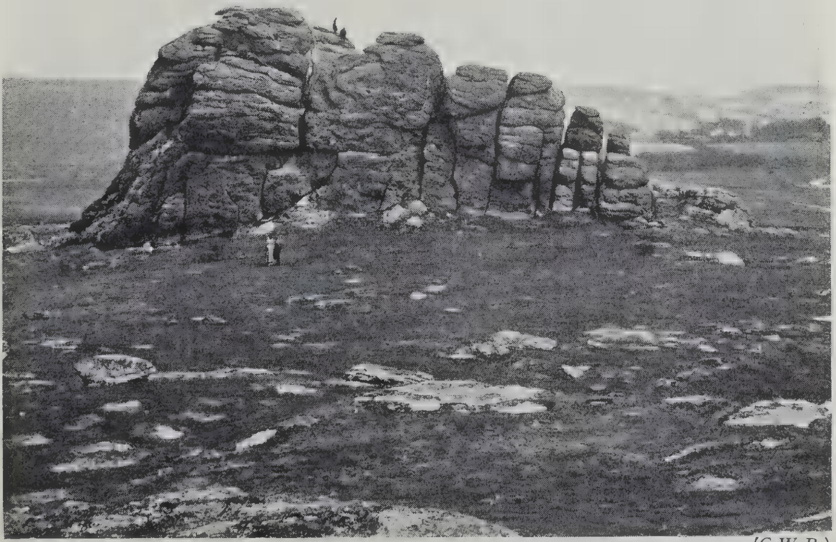


FIG. 50.—THE SOUTH-WESTERN PENINSULA



(G.W.R.)

FIG. 51.—SCENE ON DARTMOOR

and the lowlands. **Dartmoor** and all the uplands to the west of it are made of granite, a very hard rock which leaves little soil when it is worn away by the weather. The granite hills are, therefore, barren moors, with few trees, little grass, and practically no farms.

Exmoor is made of such rocks as sandstone and slate, which leave rather more soil when they weather away. It is, therefore, a region of bracken and coarse grass, with many deep glens in which the red deer hide.

Many of the lowlands, such as the **Vale of Taunton** and the **Vale of Crediton,** are covered with a fertile red soil which has been formed by the weathering of the red rocks underneath.

THE WORK OF THE PEOPLE

Farming is the chief occupation in all the three counties which make up the South-Western Peninsula. The moist climate favours the growth of good grass, and the winters are so mild that cattle are often kept out of doors all the year.

Cornwall and Somerset are particularly noted for dairy farming, while Devon specialises in raising hardy young beef cattle, which are sold to farmers in the Midlands and other places, where they are fattened for the market.

Fruit growing and **market gardening** are encouraged by the mild winter and the warm, sunny spring. In Devon and Somerset there are many orchards which produce the apples from which cider is made. The coastal districts of Cornwall specialise in growing vegetables, since they are ready for the market long before those grown in other parts of Britain. " Early potatoes are ready in May, and on the same ground broccoli are then planted for the November to February markets."[1]

The **Scilly Isles** form the most southerly part of Britain, and also get the fullest benefit from the warm, moist south-westerly breezes, and the warm Gulf Stream Drift. Here the

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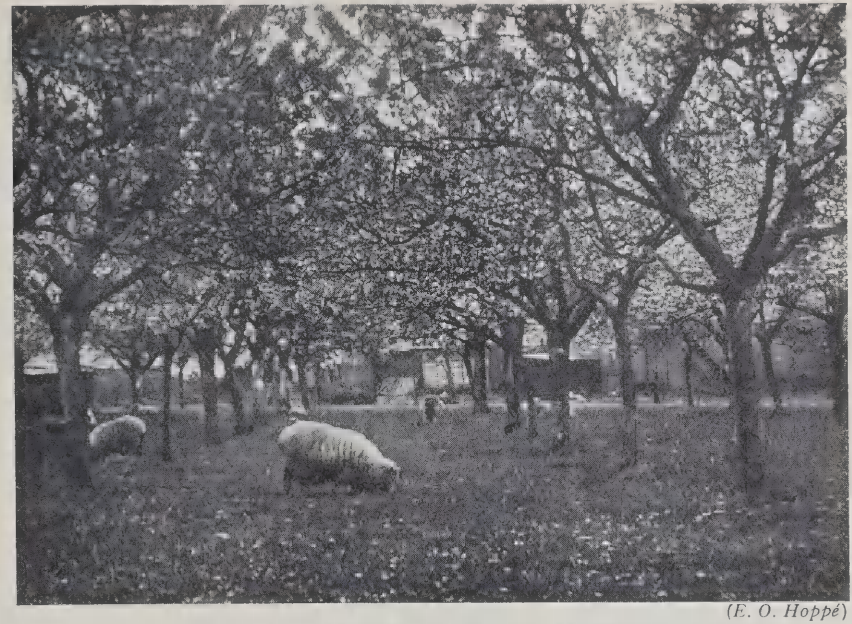
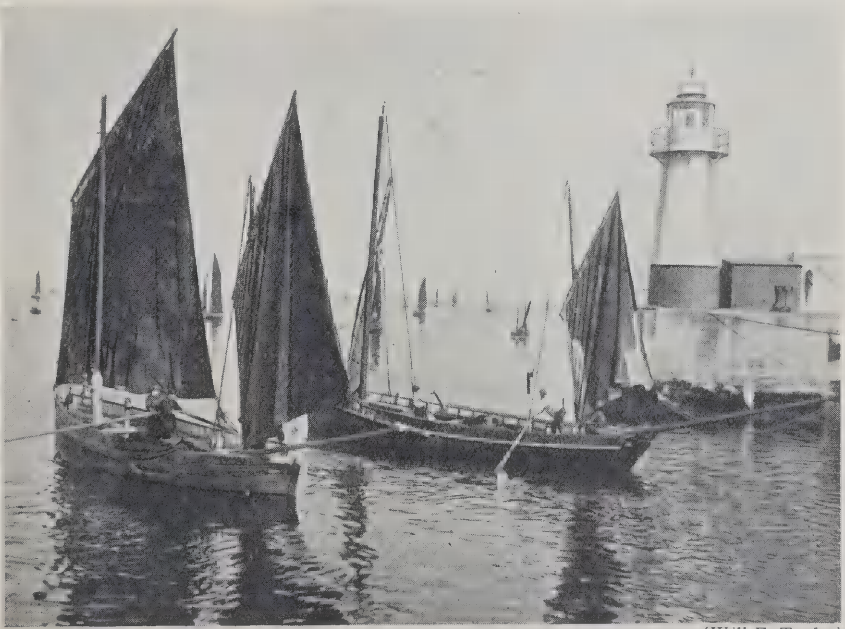
[1] W. S. Lewis.



(E. O. Hoppé)

FIG. 52.—APPLE ORCHARD IN DEVON



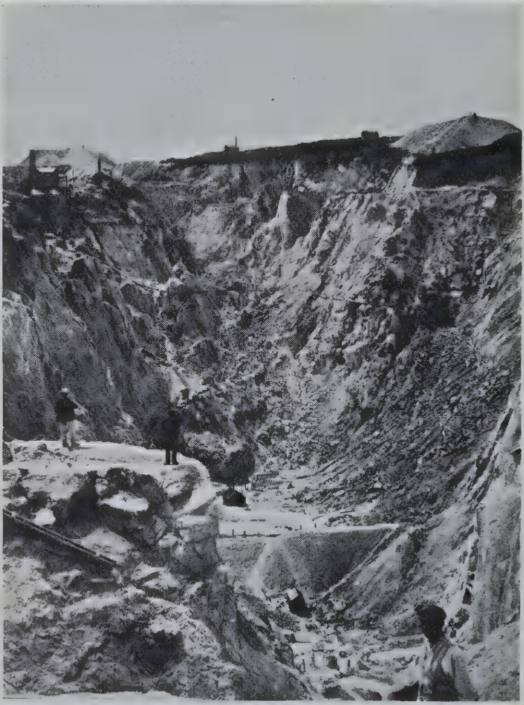
(Will F. Taylor)

FIG. 53.—PILCHARD BOATS LEAVING NEWLYN HARBOUR, CORNWALL

majority of the people depend for a living on the daffodils and other spring flowers, which are ready for the market early in the New Year.

Fishing.—Men who live on the coast often prefer to reap the harvest of the sea rather than the harvest of the land. This is especially true on the coast of Cornwall, where there are many deep inlets and sheltered coves. Cold-water fish such as herring and mackerel are caught, as well as pilchards, which live in the warmer seas of the south.

One great drawback to the fishing industry is that the South-Western Peninsula is a long way from any densely peopled district, and this lack of near-by markets prevents the full development of the industry. Some of the chief fishing ports are Plymouth, Brixham and St. Ives.



(*Will F. Taylor*)

FIG. 54.—CHINA CLAY PIT, CORNWALL

Mining and Quarrying.— More than 2,000 years ago Cornwall was famous for its tin ore, and up to the middle of the last century it was the chief source of tin in the world. Nowadays, however, tin ore can be mined much more cheaply in Bolivia, Malaya, Java and other countries. Nearly all the tin mines of Cornwall have, therefore, been abandoned. Another metal which used to be obtained from Cornwall is copper, but the mining of it ceased long ago.

By far the most important mineral product of the South-Western Peninsula in these days is kaolin or china clay. This is a fine white clay which is formed by the decay of granite. It is quarried on the edge of the granite moors and exported from Fowey and Plymouth. It is used in North Staffordshire for making porcelain, in Lancashire for making the " size " with which cotton yarns are treated, and in paper works for the " filling " which gives a smooth surface to writing paper.

The Tourist Industry.—We have seen how the people of the south-west " sell " their mild climate in the form of early flowers and vegetables. They also derive profit from the combination of warm winters, abundant sunshine and beautiful scenery ; for these attract many visitors in both summer and winter, and many people are employed in catering for their needs.

Among the most popular of such holiday resorts are Torquay, Ilfracombe and Weston-super-Mare, but you will find many others by studying railway posters and other advertisements.

THE TOWNS

The South-Western Peninsula has few large towns, because it has no coalfield, and consequently no great industries. **Exeter,** the county town of Devonshire, is situated in the middle of a fertile plain, and at the head of navigation on the river Exe. It has, therefore, always been the centre of the roads, and so was the most convenient place for trade. Its name suggests that it was a Roman fortress ; its famous cathedral shows that it was an important place in bygone times ; and its large cattle market and its manufactures of agricultural machinery show that it is still a market for the rich farm lands around.

Plymouth is situated on a splendid harbour which was formed ages ago by the " drowning " of the lower part of the Tamar Valley (see fig. 55). Though it has well-equipped

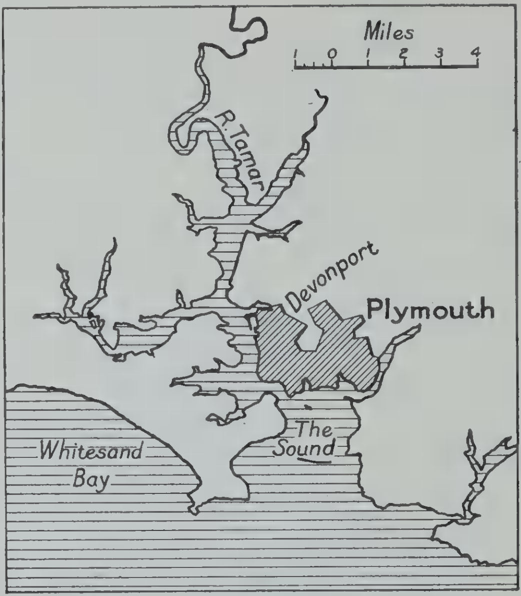


FIG. 55.—THE SITUATION OF PLYMOUTH

docks it is too far from the great centres of population to become a great port. Atlantic liners on their way up the Channel sometimes call there to land passengers and mails, which are then taken forward to London and other places by fast trains. **Devonport,** which is now reckoned as part of Plymouth, is one of our chief naval stations.

EXERCISES

1. Draw a sketch-map of the South-Western Peninsula to show how the railways avoid the high land.

2. Draw a sketch-map to show why Exeter has become an important market town.

3. In proportion to her area, Cornwall has :

(*a*) One and a half times as much arable land as Devonshire.
(*b*) Sixty per cent. more cattle than Devonshire.
(*c*) Only two-thirds as many sheep as Devonshire.

Give reasons for these facts.

CHAPTER X

THE HAMPSHIRE BASIN

How Nature made the Basin.—If you take a piece of paper and bend it up round the edges you will make a basin-shaped hollow. In the same way Nature made the Hampshire Basin by folding the thick layer of chalk rock which comes to the surface as ranges of hills in many parts of south-eastern England.

The " rim " of the Hampshire Basin is everywhere formed of chalk. In the north is the broad plateau known as Salisbury Plain, from which the South Downs and the Western Downs run off to east and west respectively. In the extreme south is a narrow range of chalk hills running through the " Isle " of Purbeck (really a peninsula) and the Isle of Wight.

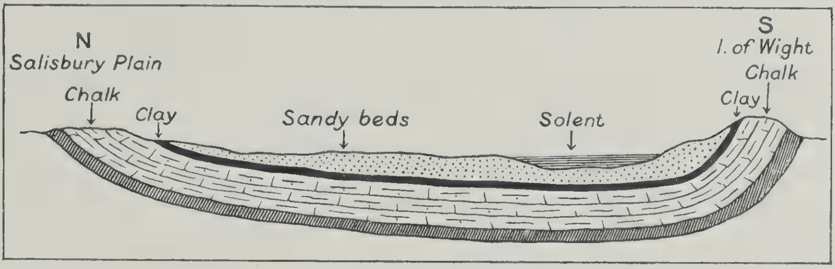


FIG. 56.—SECTION ACROSS THE HAMPSHIRE BASIN

Many millions of years ago the Hampshire Basin was a hollow occupied by an inland sea. In course of time this sea was filled up with the sand and mud poured into it by many rivers, and in this way the plain which covers most of Hampshire was formed.

But Nature never seems satisfied with her handiwork. No sooner had she made the basin than she began to destroy it. The waves of the sea beat against the southern wall of chalk, eating it away bit by bit until great gaps were formed in it. Then the land sank a little, and the sea flowed through the gaps it had made, forming the channels now called the Solent, Spithead and Southampton Water.

The destruction of the boundary wall of the basin is still going on, and may be quite clearly seen on the coasts of the " Isle " of Purbeck and the Isle of Wight. Here and

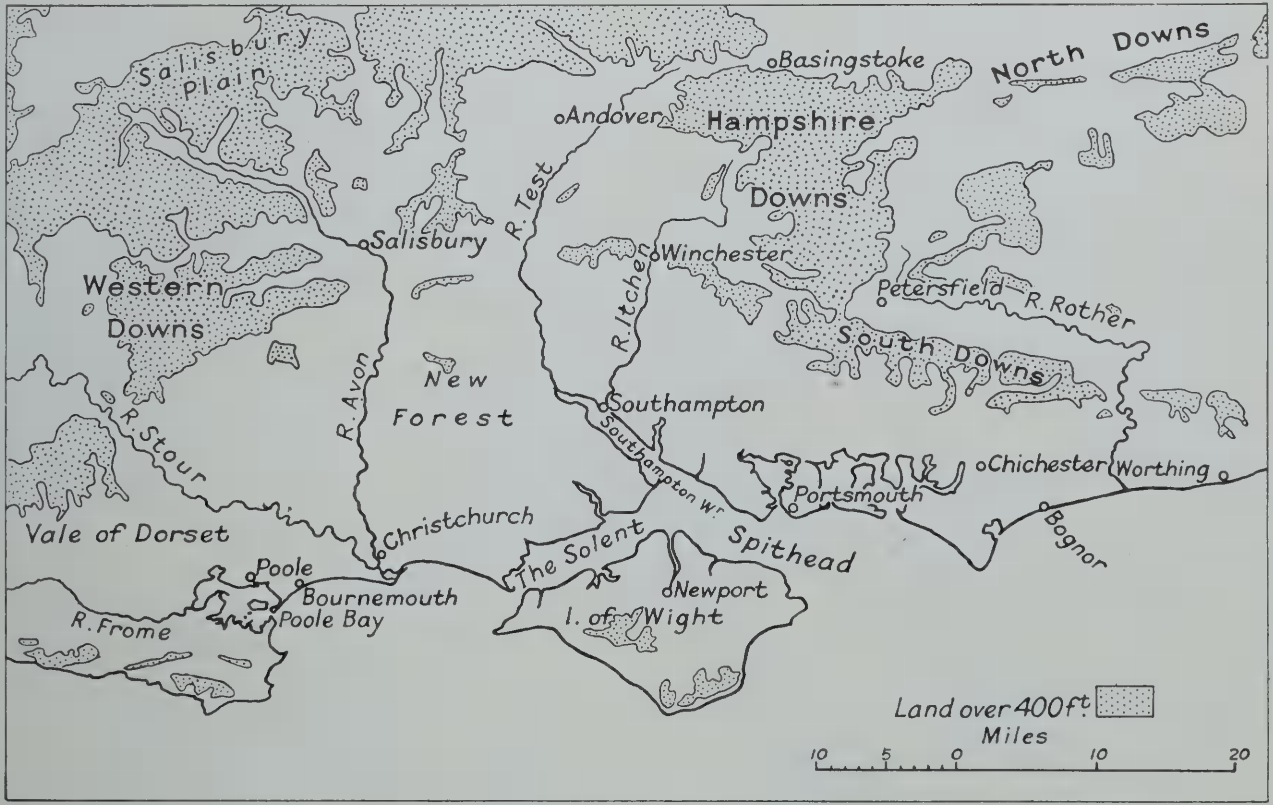


FIG. 57.—THE HAMPSHIRE BASIN

there are pinnacles of chalk which are cut off from the mainland. These "stacks," as they are called, must once have been part of the cliffs from which they are now separated by the sea; they are the slightly harder parts which the sea has not been able to wear away so quickly as the rest of the chalk cliff. The narrow entrance to Lulworth Cove marks the place where the sea has worn

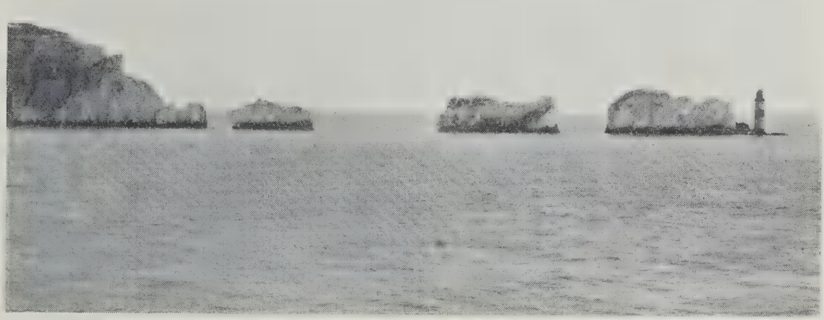

(*Topical Press*)

FIG. 58.—THE NEEDLES, ISLE OF WIGHT

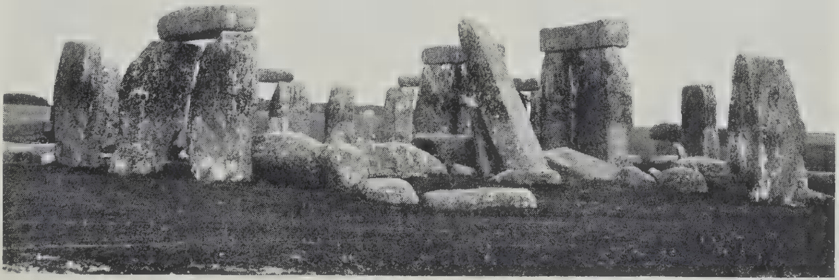

(*G.W.R.*)

FIG. 59.—STONEHENGE

through the wall of chalk, and the cove itself is the circular hollow which the waves have easily cut out of the softer rocks behind the chalk. In the far, far distant future there may be no chalk cliffs left on this part of the coast.

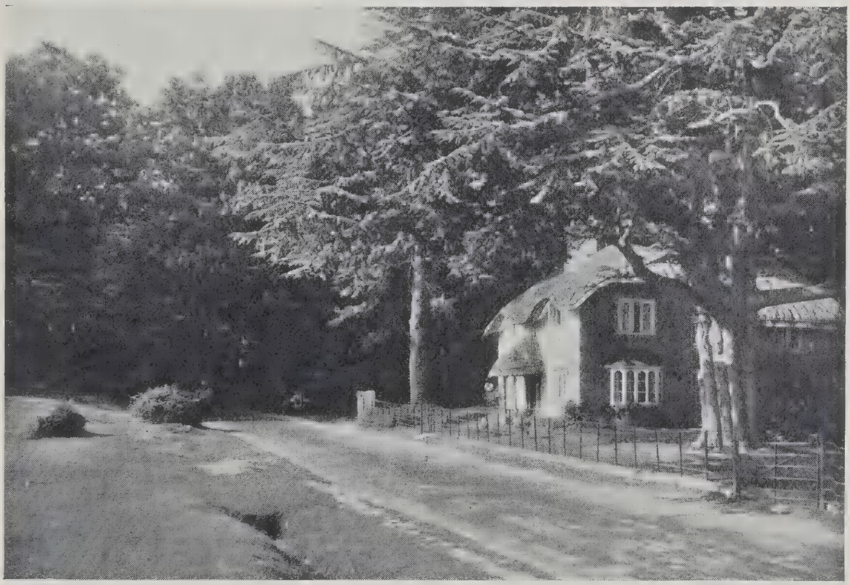
How the Rocks controlled History.—Having learnt a little about the history of the rocks in the Hampshire Basin, let us now consider some ways in which the rocks have influenced the course of human history.

One of the most ancient structures in the British Isles is Stonehenge, a circle of huge stones situated on Salisbury Plain. No one knows exactly who built it, but it is certainly more than 3,000 years old. Undoubtedly it was used as a temple by people who worshipped the sun, and to it ancient pilgrim tracks lead from many directions. We do not know why the temple was built just there, but we can give several reasons why it was built on Salisbury Plain—because the land is high and level, because it is dry and can be reached by dry tracks from many directions, and because the people who used it lived only on the hills. Behind all these reasons is the chief reason of all—Salisbury Plain is at the meeting point of all the chalk ridges of England.

Chalk hills are dry because the rock readily lets rain water soak through ; for the same reason the chalk forms high land, since the water sinks through it instead of wearing it away by flowing on the surface ; and the early inhabitants of our land lived mainly on the high, dry chalk lands, since the lowlands were chiefly covered with forest and marsh.

How important Salisbury Plain was in very early times is seen by the numerous ancient settlements whose sites have been discovered. The best way of finding these is by taking photographs from aeroplanes. Ancient earthworks and roadways, which may be invisible to the naked eye, often stand out quite clearly on such photographs.

Now let us think of an event in history which no schoolboy ever forgets—the death of William Rufus while hunting in the New Forest. What has that to do with geography and how is it connected with the particular kinds of rock? See if you can follow this out: the sandy rock which covers most of the lowlands of Hampshire gives infertile soil; because the land is barren it was not worth cultivating, and so remained a thinly peopled area of woodland and heath; when William I conquered England he chose the Forest as a hunting ground because wild animals were plentiful and human beings few. Had the soil been fertile, instead of sterile sand, it is unlikely that the death of William II would have occurred when and where it did.



(*Will F. Taylor*)

FIG. 60.—NEAR LYNDHURST, IN THE NEW FOREST

How the Rocks control Men's Work To-day.—The kind of farming men do in different parts of the Hampshire Basin depends very largely on the kind of rock. Salisbury Plain and the chalk ridges which spring from it are used mainly for sheep rearing, since the thin soil overlying the chalk supports short juicy grass, which is particularly suitable for sheep.

The best farm land in the Hampshire Basin is found in the valleys near the edge of the chalk, for there outcrops a deep fertile clay which grows good corn and meadow grass. The sandy lowlands of Hampshire do not form good agricultural lands.

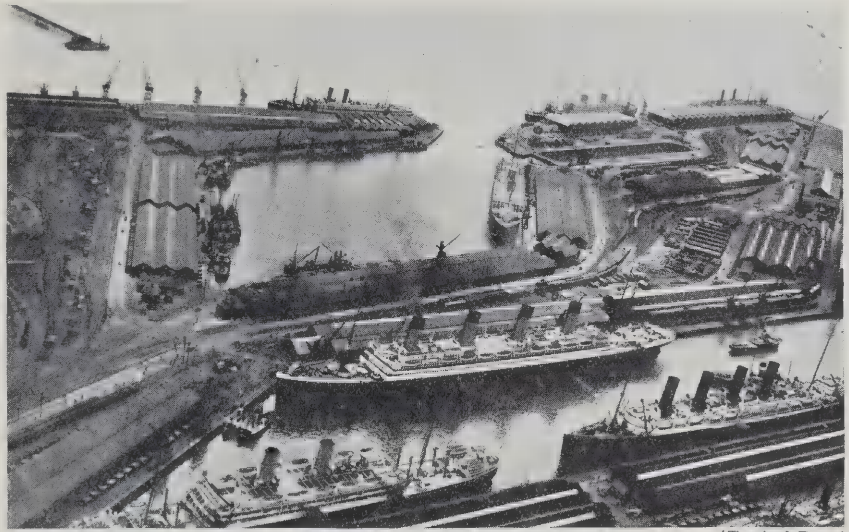
The New Forest still occupies a very large area, though large parts of it are not forest at all, but wide stretches of heath and moor on which roam herds of half-wild ponies. In some districts, however, the sandy soils have been found suitable for market gardening and fruit growing, and large quantities of strawberries are sent every spring from the Hampshire Basin to the markets in London, the Midlands and the North.

THE TOWNS OF THE HAMPSHIRE BASIN

Winchester, situated in the centre of the basin, where many routes meet, and at the head of boat navigation on the river Itchen, was the capital of the Saxon Kingdom of Wessex and for a time the capital of England. **Salisbury,** another ancient city situated where the river Avon breaks through the northern rim of chalk, is now noted chiefly for its beautiful old cathedral, which has the loftiest spire in England. **Southampton** is the chief passenger port of the British Isles and the fifth port in respect of the value of cargo dealt with. One great advantage of the port is that its sheltered harbour is so deep that the largest ocean liners can berth at any state of the tide. Passengers from overseas bound for London save many hours by landing at Southampton and finishing their journey by express train.

Portsmouth, situated near the entrance to Spithead, is a great naval depot. The industries such as ship-fitting and engineering which have sprung up there have made it a much larger town than Southampton.

Other towns in the Hampshire Basin are either small market towns such as *Dorchester* and *Christchurch*, or holiday resorts such as *Bournemouth.* In the Isle of Wight, *Shanklin*, *Ventnor* and *Sandown* are well-known residential centres, while *Cowes*, facing the sheltered waters of the Solent, is a famous yachting centre.



(*Topical Press*)

FIG. 61.—SOUTHAMPTON DOCKS

THE CHANNEL ISLANDS

Though situated close to the coast of France, these islands are British. The inhabitants are of French descent and French is the official language, though English is taught in the schools.

The islands are noted for cattle, both Jersey and Alderney having given their names to special breeds. Market gardening is an important industry, and large quantities of early potatoes, vegetables and fruit are sent to the English markets.

EXERCISES

1. Draw from the atlas a sketch-map to show that Southampton is an important railway centre.

2. Hampshire (including the Isle of Wight) is about as large as Somerset, but has less than half as many cattle and less than half as many sheep. Give reasons for this.

3. From a railway or bus time-table find out how long it would take to reach Bournemouth from your home. Draw a sketch-map of your route.

4. Draw sketch-maps of the routes taken by (*a*) the " Pines Express," (*b*) " Cornish Riviera Express."

5. Southampton is the third port of Britain in respect of the total tonnage of ocean vessels using the port, but only fifth in respect of the total value of its ocean trade. Give a reason for this difference.

CHAPTER XI

THE SOUTH-EAST

Between the Thames and the south coast lie several belts of rock arranged like horse-shoes one within another. To find out why the rocks are so arranged, build a model according to the following instructions : make a large oval mound of clay or plasticine ; cover this all over with a layer of some particular colour and over this place another layer of a different colour. Now start to shave off the top of your model with a knife. As you do so you will see your layers appear one by one, until all are visible as ovals round the central mass.

Formerly south-eastern England was part of a " dome " made of several layers of rock bent over as in the above model. The weather gradually wore off the top of the dome, causing the various layers of rock to show up around it. There are, however, two important differences between the above model and the actual land surface. As shown in fig. 63 some of the layers of rock stand out well above the others. On the northern and southern edges the chalk stands out as the escarpments called the North and South

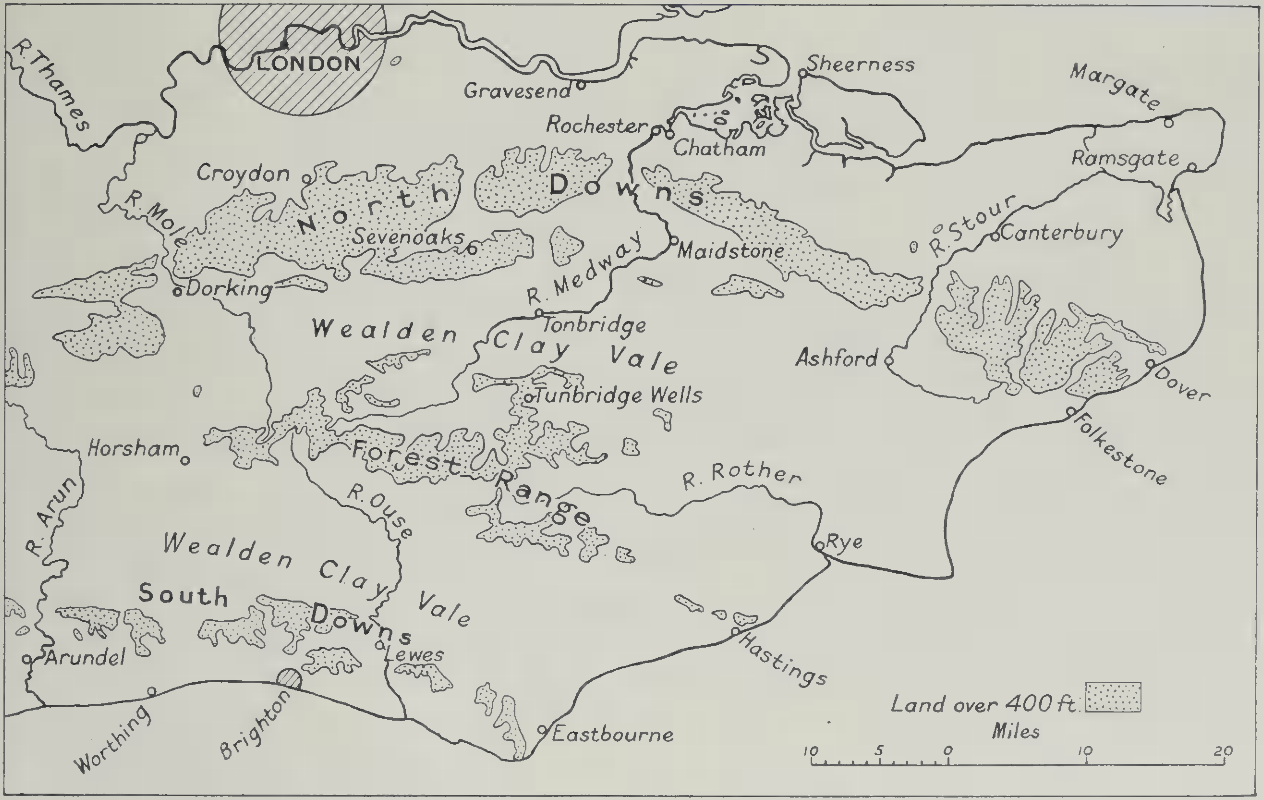


FIG. 62.—SOUTH-EASTERN ENGLAND

Downs; within the chalk scarps is another ridge formed of sandstone; and in the centre is the Forest Range, which is also formed of sandstone. The chalk and sandstone stand out as ridges because they are fairly hard rocks and because they let the rain water soak through them. Between the ridges are broad vales formed of clay, which has been more easily worn away.

Where the chalk ridges run out to sea there are steep cliffs and bold headlands, such as North Foreland, South Foreland and Beachy Head.

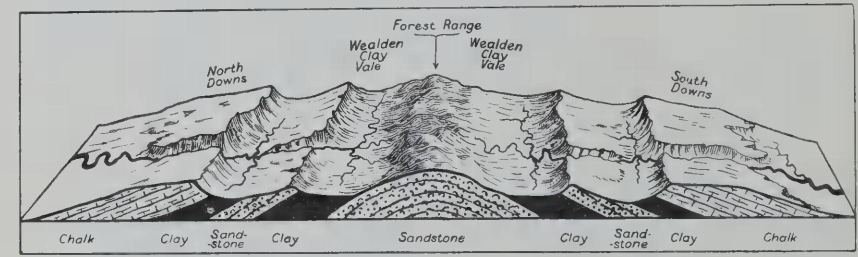
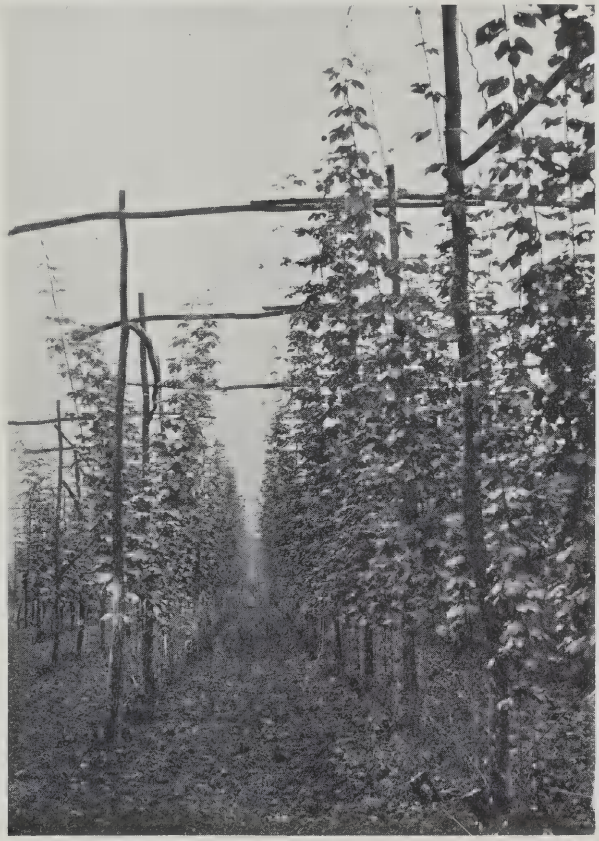


FIG. 63.—GEOLOGICAL FORMATION OF THE NORTH AND SOUTH DOWNS

Farming.—In the last chapter we saw that the rocks which make up the Hampshire Basin have had a great effect on the life of the people. Similar effects are seen in the south-eastern corner of England. The North and South Downs are, as we should expect, largely given up to sheep rearing; the clay vales form arable and dairying lands; and the sandy Forest Range is a rather infertile region of woodland and heath. In eastern Kent, however, the soil is a mixture formed from the waste of two or three different kinds of rock. Here the land is very fertile, and as there is plenty of sunshine, especially in summer, a great many farmers specialise in market gardening, fruit growing and the cultivation of hops. So important, indeed, are these industries that Kent is often called the "Garden of England."

Nearly a quarter of the fruit and nearly two-thirds of the hops grown in England are produced in Kent and the neighbouring part of Sussex. The fruit harvest begins in June, when the strawberries are ripe; then follow cherries and plums during the summer, and apples and pears in autumn and early winter.

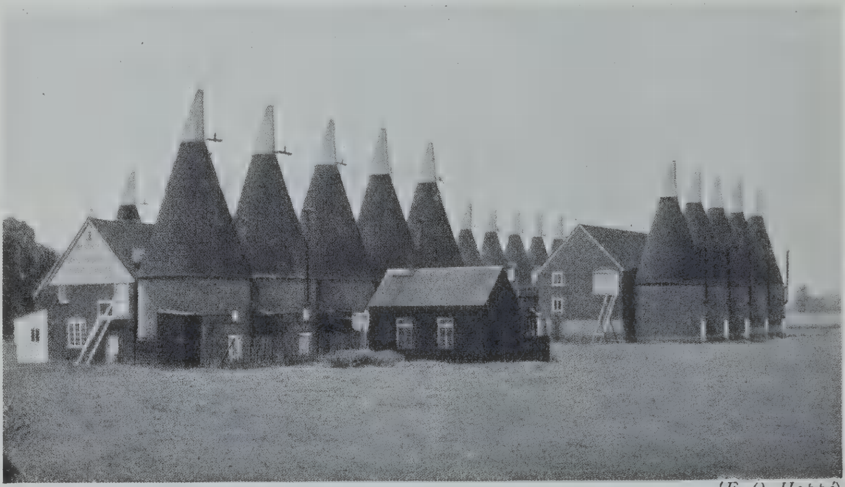


(*E. O. Hoppé*)

FIG. 64.—HOP GARDEN IN KENT

The cultivation of hops requires a good deal of labour and they can be grown only on deep, fertile soil which has been well worked and manured. The plants are supported by poles, or trained up lengths of yarn which are attached to wires running across the gardens at a height of 13 or 14 feet.

The busiest time in the hop-gardens is September, when the picking is done. As a single farm may require several hundred people for this work, sufficient labour cannot be obtained in the locality, and every year many thousands of men, women and children migrate from the East End of London to Kent for the hopping season.

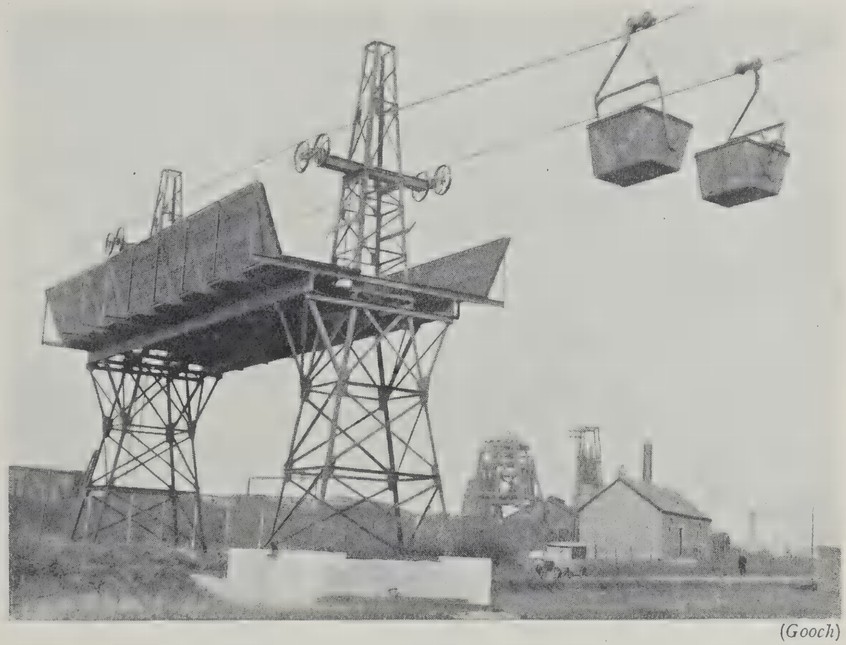


(*E. O. Hoppé*)

FIG. 65.—OAST HOUSES IN KENT

Mining.—Hidden away in the quiet woods of the Weald, as the middle part of the dome is called, are many picturesque pools known as *hammer ponds*. They are reminders of the days when this district was one of the chief iron-mining and iron-working areas in Britain. The ore was crushed by hammers worked by the water power obtained from the "hammer ponds," and smelted with charcoal made in the neighbouring forest. When coke replaced charcoal for the smelting of iron ore the industry died, and though there is still a good deal of iron ore in the Weald none of it is now mined.

In recent years, however, a new mining industry has grown up. Deep down under the chalk in eastern Kent rich coal-seams exist, and there are now two or three collieries working this "concealed coalfield."



(Gooch)

Fig. 66.—OVERHEAD CONVEYERS, TILMANSTONE COLLIERY, NEAR DOVER

GAP TOWNS AND COASTAL TOWNS

A curious thing about the rivers of the Weald is that, instead of following the clay vales to the sea, they turn northward or southward and cross the Downs by deep gaps. Most of the inland towns of the south-east are situated in or near such gaps, good examples being Guildford on the river Wey, Dorking on the river Mole, and Lewes on the Sussex Ouse. It is quite easy to understand why the towns grew up in such positions. In many cases boats could get up the rivers as far as the gaps in the chalk, but no farther ; roads from north to south make for the gaps to avoid rising on to the chalk heights ; castles built in the gaps were in a good position to control the countryside; and markets grew up where the roads met, and where the castle afforded protection to the traders. In modern times the railways, even more than the roads, utilise the gaps, and so many of the gap towns have greatly increased in importance.

Canterbury, situated at the head of boat navigation on the river Stour, has been important from very early times. Indeed, long before the Roman Conquest it must have been a busy port, for from it the Pilgrims' Way, an ancient track used by the "sun worshippers" mentioned in the previous chapter, leads along the North Downs to Stonehenge. In Roman times it was an important station on Watling Street, which led from Dover to London. In 597 St. Augustine, who introduced Christianity to Britain, settled in Canterbury and ever since it has been the ecclesiastical capital of the country.

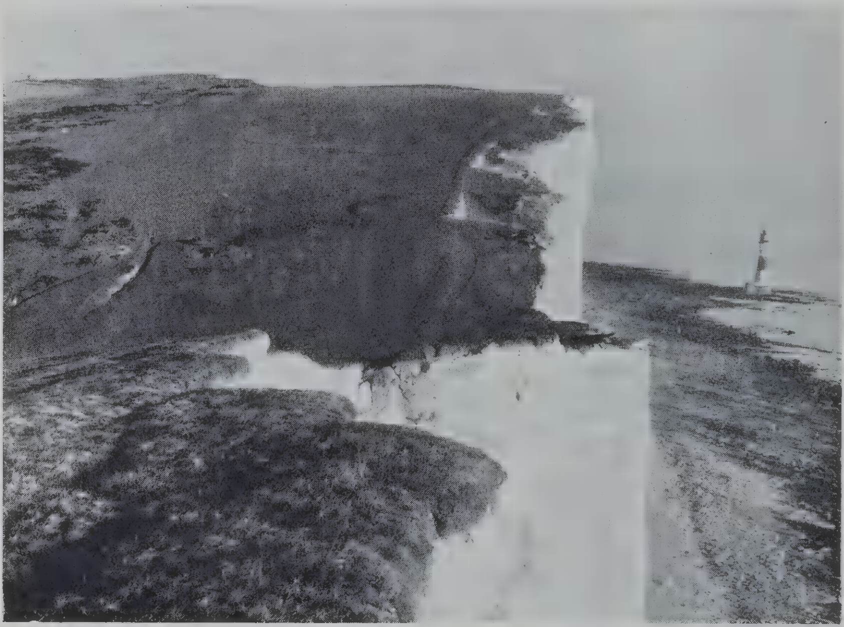
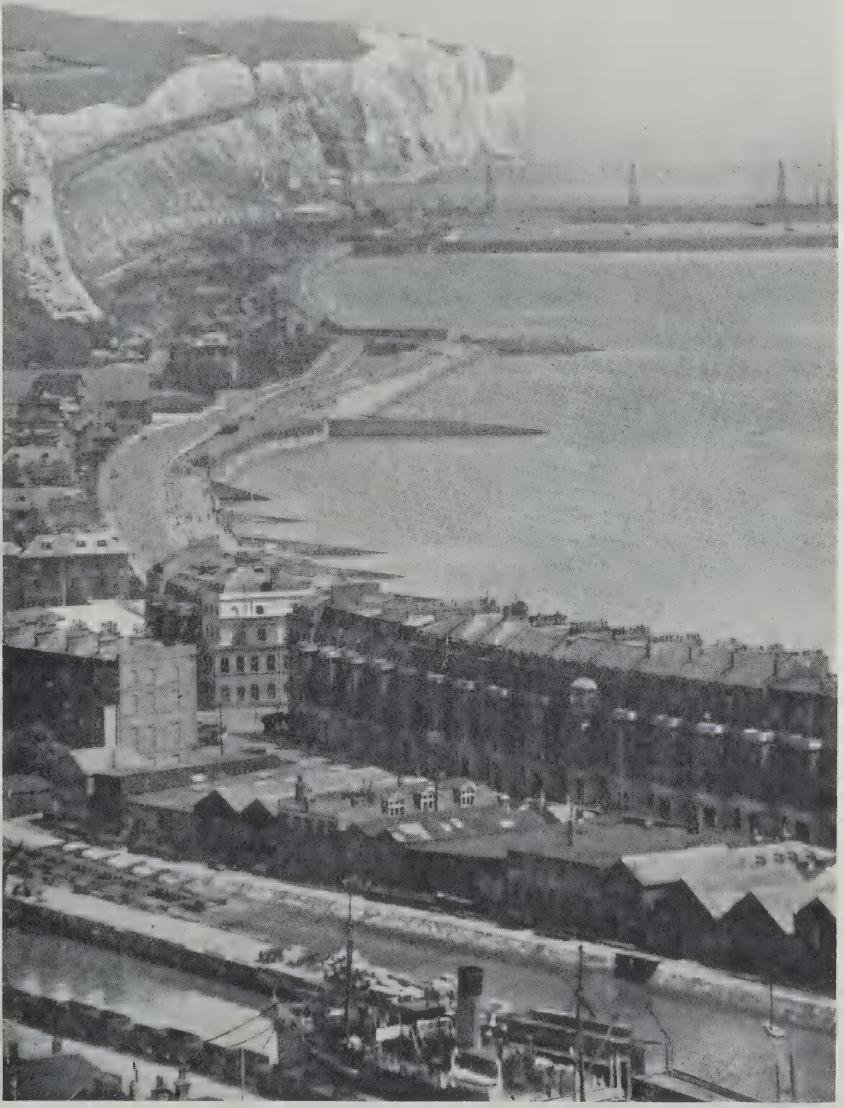

(*Will F. Taylor*)

FIG. 67.—BEACHY HEAD



(*E. O. Hoppé*)

FIG. 68.—DOVER

Many of the coastal towns were also of great importance in early times, as they provided links between Britain and the Continent. In Anglo-Saxon and Norman times the chief ports were Hastings, Romney, Hythe, Dover and Sandwich. These were called the *Cinque Ports*, "cinque" being the French word for five. For five or six hundred years these ports, and others which were known as "limbs," had the responsibility of providing the Kings of England with ships and sailors in time of war. In return they enjoyed a great many privileges which were denied to other ports.

Nowadays all these ancient harbours, save that of **Dover,** are silted up. Dover Harbour does not silt up because it is formed by a deep cleft in the chalk, and has no large stream running into it. It has been improved by the building of breakwaters, and is now the chief "packet station" on the south coast.

Other packet stations for cross-Channel boats are **Folkestone** and **Newhaven.**

All along the coasts of Kent and Sussex are holiday resorts which cater specially for the people of London. **Brighton** has become the largest of such towns, partly because it is at the nearest point on the south coast to London. Other well-known resorts are **Eastbourne, Hastings, Ramsgate** and **Margate.**

The towns around the estuary of the Medway form a group apart from the rest. **Rochester** is an ancient city which grew up where the road from Canterbury to London crossed the Medway. Its chief industry in modern times is engineering, and everybody is familiar with one of its chief products—the "Invicta" steam-roller. **Chatham,** which adjoins Rochester, is a newer and bigger port. It is one of the chief naval stations of Britain, and has dockyards and barracks. Its chief industry is shipbuilding. **Gillingham** lies a little east of Chatham. Though not so well known as the latter it is a larger town and has several important industries, such as the manufacture of cement and paper.

EXERCISES

1. In proportion to her population Kent has one and a half times as many men employed in agriculture as Surrey has. Give reasons for this.

2. One of the fastest trains in England does the 40-mile run from Croydon to Brighton in 46 minutes. Draw a map of its route.

3. Kent has a population of 1,200,000, and Sussex has 500,000. Make a population map by tracing the two counties and inserting in each one dot for 10,000 people.

4. Draw a sketch-map to show the chief cross-Channel steamer routes.

CHAPTER XII

THE THAMES BASIN

If we draw a line round the sources of all the tributaries of the Thames, we shall mark out the *watershed* which bounds the *river basin* (see fig. 69). A watershed is often said to be like the ridge of a roof. So it is, since the water drains away

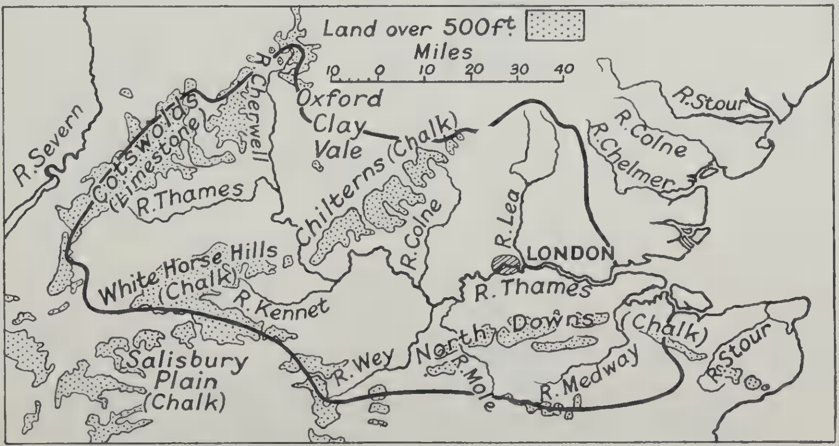
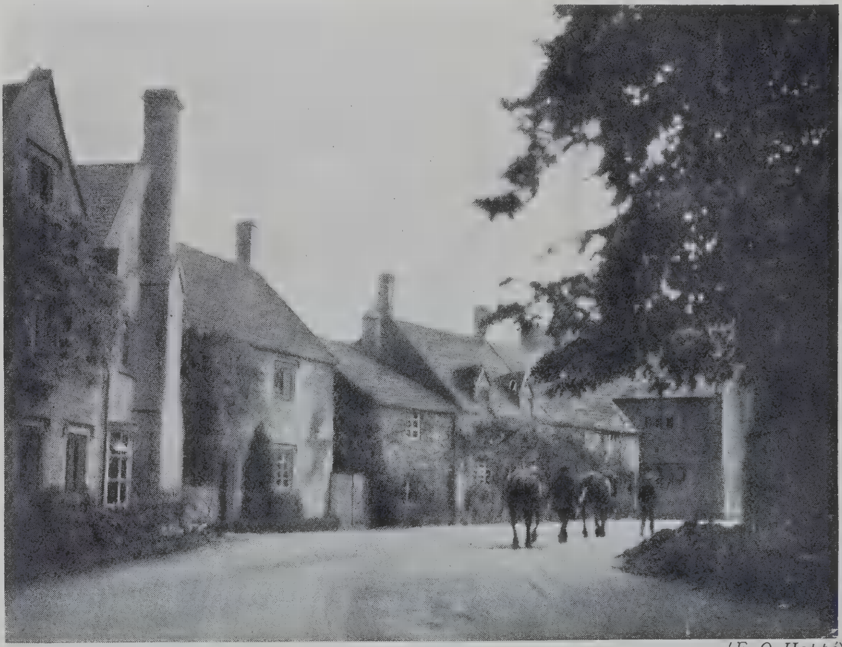


Fig. 69.—THE THAMES BASIN

from it in opposite directions. But a watershed is not always high land. If, for example, you follow the watershed of the Thames on fig. 69 you will see that almost as much of it lies on low land as on high land. The low points on a watershed are often very useful, for they make it easy for roads, railways and canals to get from one river basin to another.



(*E. O. Hoppé*)

FIG. 70.—IN A COTSWOLD VILLAGE

The Thames Basin is made up of several different types of land. In the west and north-west are the two belts of rock—limestone and chalk—which have been referred to so frequently in earlier chapters. The *Cotswolds*, which are made of limestone, have already been mentioned as good sheep lands. It was no doubt because of the local supplies of wool that **Witney** in Oxfordshire began the blanket industry, for which it is still famous.

South-east of the Cotswolds lies a broad vale which is often known as the *Oxford Clay Vale.* The lower parts of the valley form excellent pasture for dairy cattle, especially in that portion known as the *Vale of Aylesbury.*

Oxford, whose famous University is even older than that of Cambridge, is situated where the Thames is joined by its tributary the Cherwell. The valleys of these rivers have for many centuries been followed by main roads—a fact which explains the importance of Oxford in the Civil War between Cromwell and Charles I.

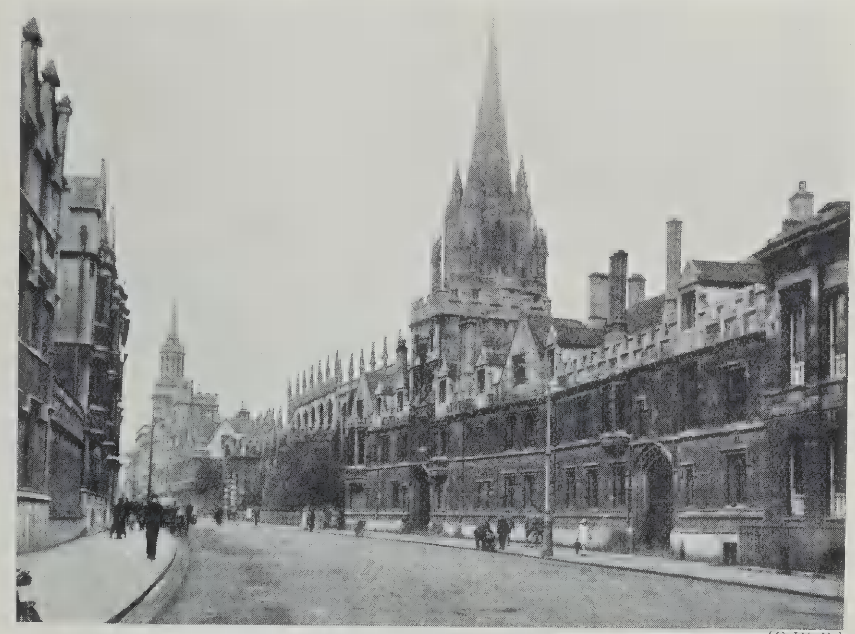

(G.W.R.)

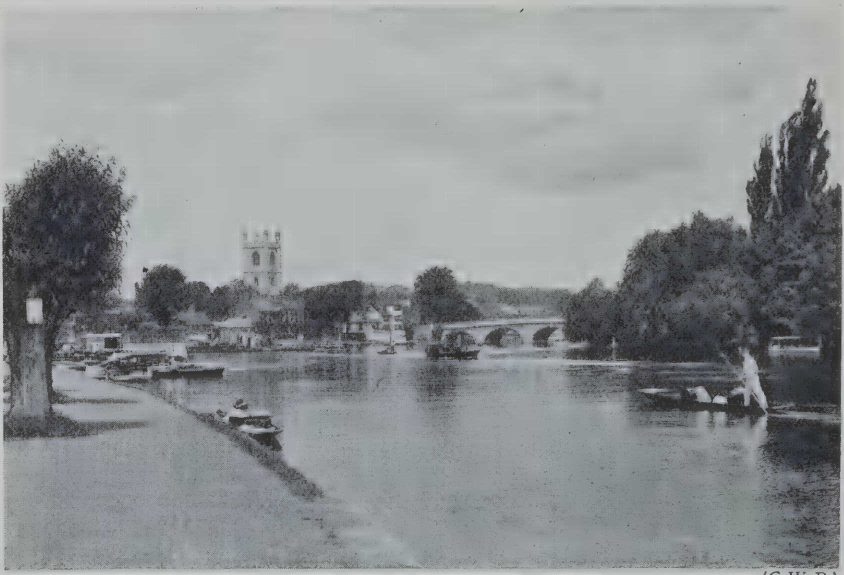
FIG. 71.—HIGH STREET, OXFORD

In modern times Oxford has become one of our chief centres for the manufacture of motor cars.

Swindon, on the main Great Western Railway which runs from London to South Wales, *via* the Severn Tunnel, manufactures railway engines and rolling stock.

Some 20 miles below Oxford the Thames breaks through the line of chalk hills in a deep gap. The *Chiltern*

Hills, which lie to the north-east of this gap, are in some places covered with a layer of clay, while in other places the chalk comes to the surface. In the latter case the hills, like the North and South Downs, are gently rounded and covered with short, sweet grass suitable for sheep. Where clay lies on the surface, however, there are dense beech woods, the most famous of which is *Burnham Beeches*. Near **High Wycombe,** the beech-wood has been used for centuries in the manufacture of chairs. Even yet some turning of chair legs, etc., is carried on in the woods by means of primitive lathes driven by treadles. The furniture-making industry of High Wycombe, however, is now carried on chiefly in factories and depends very largely on imported timber.



(*G.W.R.*)

FIG. 72.—THE THAMES AT HENLEY

The beautiful scenery of the Chilterns and the nearness to London have made the district one of the chief residential areas for people whose business is in London. Another reason why so many residential towns have grown up on the Chilterns is that the hills are crossed by all the main lines of railway which run from the Midlands to London. Though no rivers cross the range, there are many "dry valleys," through which rivers ran in far-off times when the climate was much wetter than it is now. These "wind gaps," as they are called to distinguish them from river gaps, have determined the course of the railways.

THE LONDON BASIN

The Chiltern Hills and the North Downs are the exposed edges of a layer of chalk which is bent down in the form of a basin, and the London Basin is that part of the Thames Basin which lies between these two ranges of hills. Like the Hampshire Basin, the London Basin has been partly filled with sediment. There is, however, one important difference between the two "basins": whereas the Hampshire Basin is filled mainly with sand, the London Basin is filled mainly with clay (see fig. 73). Consequently the London Basin is much more important than the Hampshire Basin for arable farming and dairying.

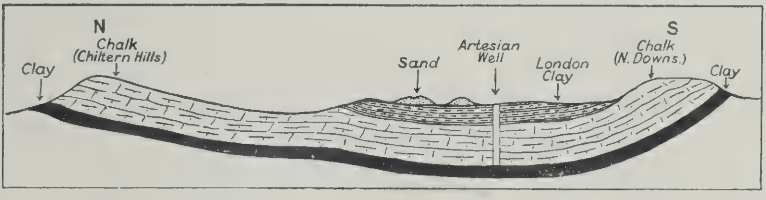


Fig. 73.—SECTION ACROSS THE LONDON BASIN

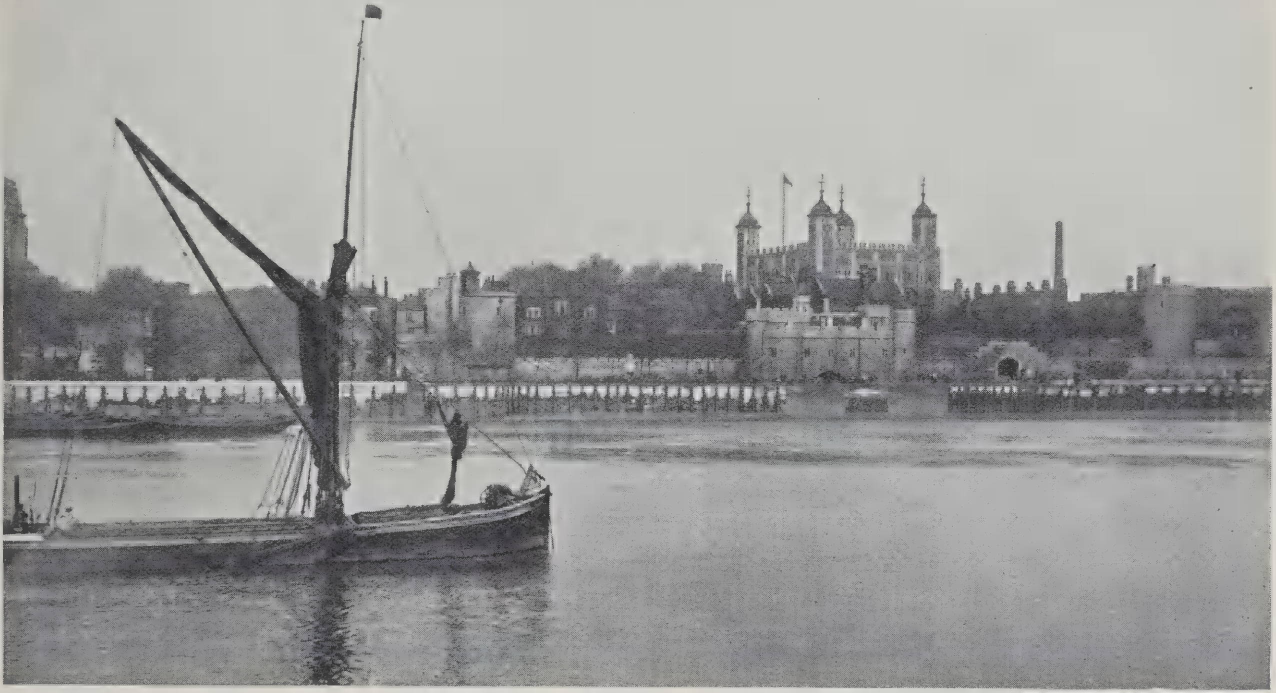
It will be seen from fig. 73 that the layer of chalk is "sandwiched" between two layers of clay. The rain water which soaks into the chalk of the Chiltern Hills and the North Downs is imprisoned between these two layers of clay, so that the chalk is permanently saturated with water. When a boring is made through the London Clay into the chalk, water rushes up the bore-hole and sometimes reaches the surface without pumping. Such borings are called *Artesian Wells*, because they were first made in the Artois district of France. Part of London's water supply is obtained from such wells, and many breweries, etc., which require large supplies of pure water, have private artesian bores.

(*E. O. Hoppé*)

FIG. 74.—THE HOUSES OF PARLIAMENT

LONDON

When the Romans invaded Britain they followed the northern edge of the North Downs until they came to the Thames. Then they turned westward along the southern side of the river, until they found a place where the channel was narrow enough and the ground on both banks firm enough to make it easy to build a bridge. On the northern side of the river, near Ludgate Hill, they built a fort ; and a little farther west, at Westminster, was another encampment which guarded a second crossing place. Around these settlements the City of London grew.



(E. O. Hoppé)

FIG. 75.—THE TOWER OF LONDON

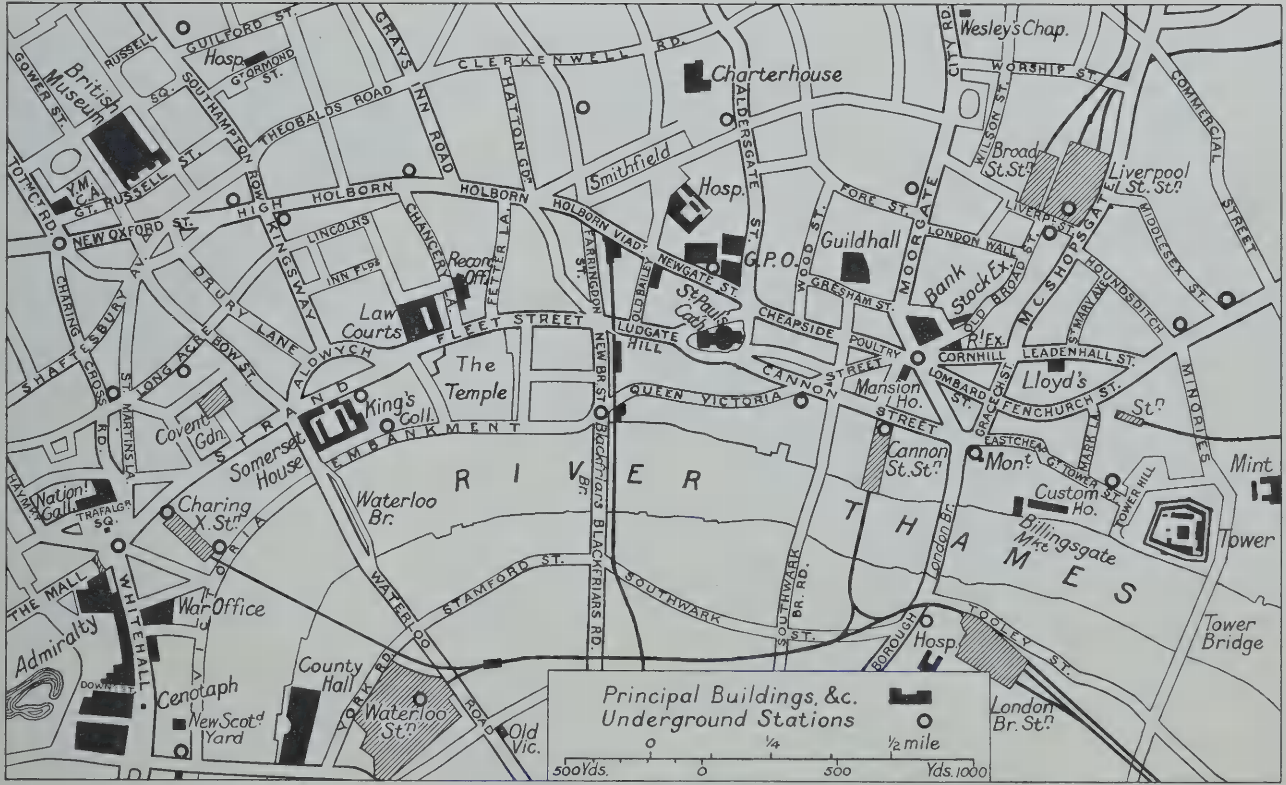


FIG. 76.—MAP OF THE CITY

From it the Roman roads radiated to all parts of the country, just as in modern times all the main roads and railways fan out from the city.

The factors which have helped to make London the greatest city in the world are :

(1) It is situated at the highest point on the Thames which can be reached by sea-going ships.

(2) The estuary opens on the busiest corner of the busiest sea in the world.

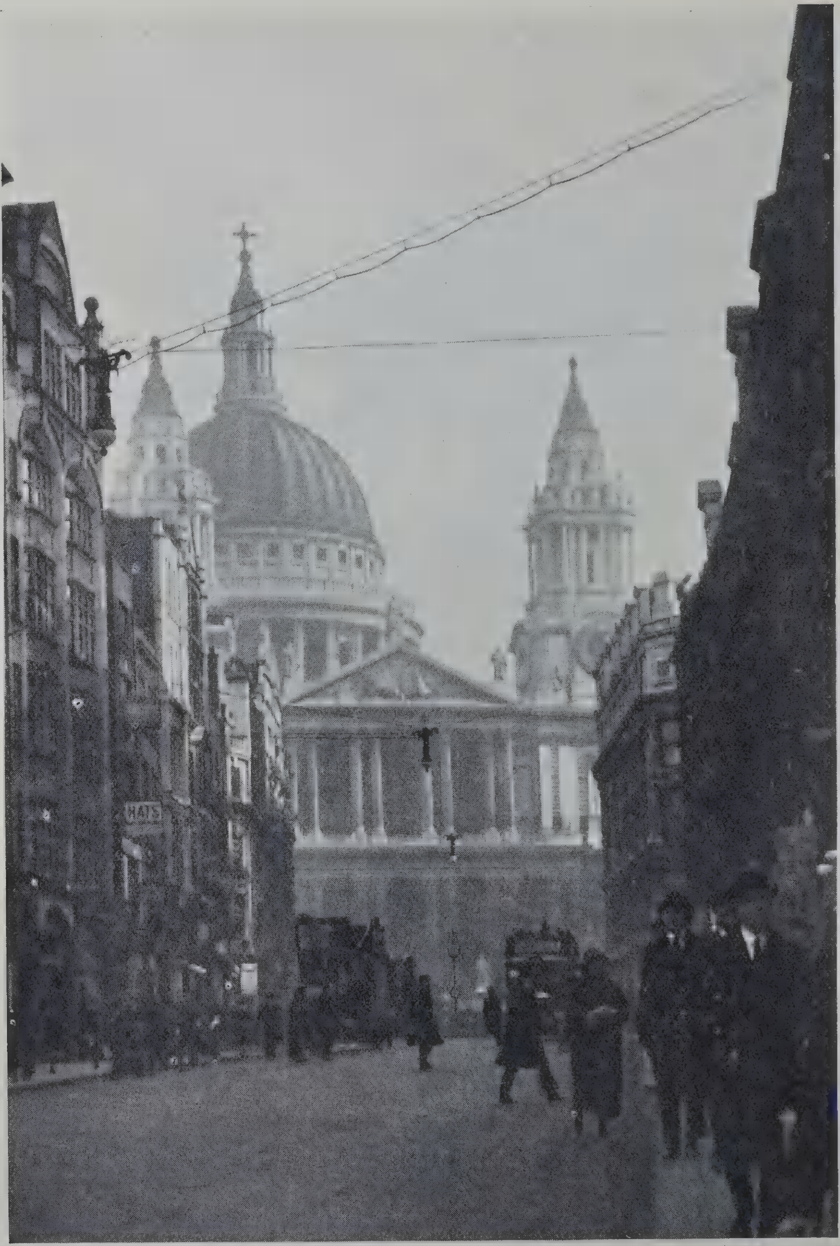
(3) The numerous roads and railways which centre on it make it easily accessible from all parts of the country.

(4) As the capital and chief port of Britain it has grown as the trade and importance of the country have grown. It is not only the governing centre, but also the banking and business centre of the country, and one of the world's chief manufacturing centres.

When people speak of London they may mean one of several things. The **City** is the small area, little more than a square mile in extent, around St. Paul's Cathedral.

The **County of London** has an area of nearly 116 square miles, and a population of 4,386,000. It contains, in addition to the City, 28 large towns or boroughs, each with its own mayor and corporation. **Greater London,** which includes all the land within a radius of 15 miles from Charing Cross, has a population of 8,203,000.

The **Port of London** includes the whole of the tidal portion of the Thames from the open sea to Teddington, a distance of nearly 70 miles. Practically all the commerce on the river is, however, confined to the section below London Bridge, which is the head of navigation for sea-going ships. Between London Bridge and Tower Bridge is the section of the river known as the *Upper Pool*, while the portion between the latter bridge and Limehouse is known as the *Lower Pool.* Vessels drawing about 10 to 14 ft. of water can navigate the " Pools," but the large ocean steamers are accommodated in the



(*E. O. Hoppé*)

FIG. 77.—ST. PAUL'S CATHEDRAL AND LUDGATE HILL

numerous large docks which have been excavated in the soft ground lying on each side of the river, about 40 miles from the open sea.

The largest of these docks are the *Surrey Commercial Docks*, which deal chiefly with timber and dairy produce ; the *West India Docks*, where wool, tobacco, fruit, wine and sugar are imported ; and the *Royal Victoria and Albert* and *King George V Docks*, which deal with all classes of imports—meat, dairy produce, wheat, fruit, fish, timber, etc.

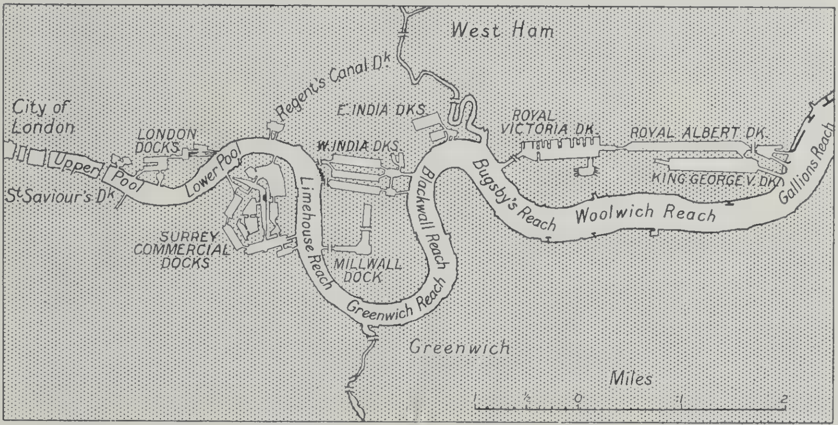
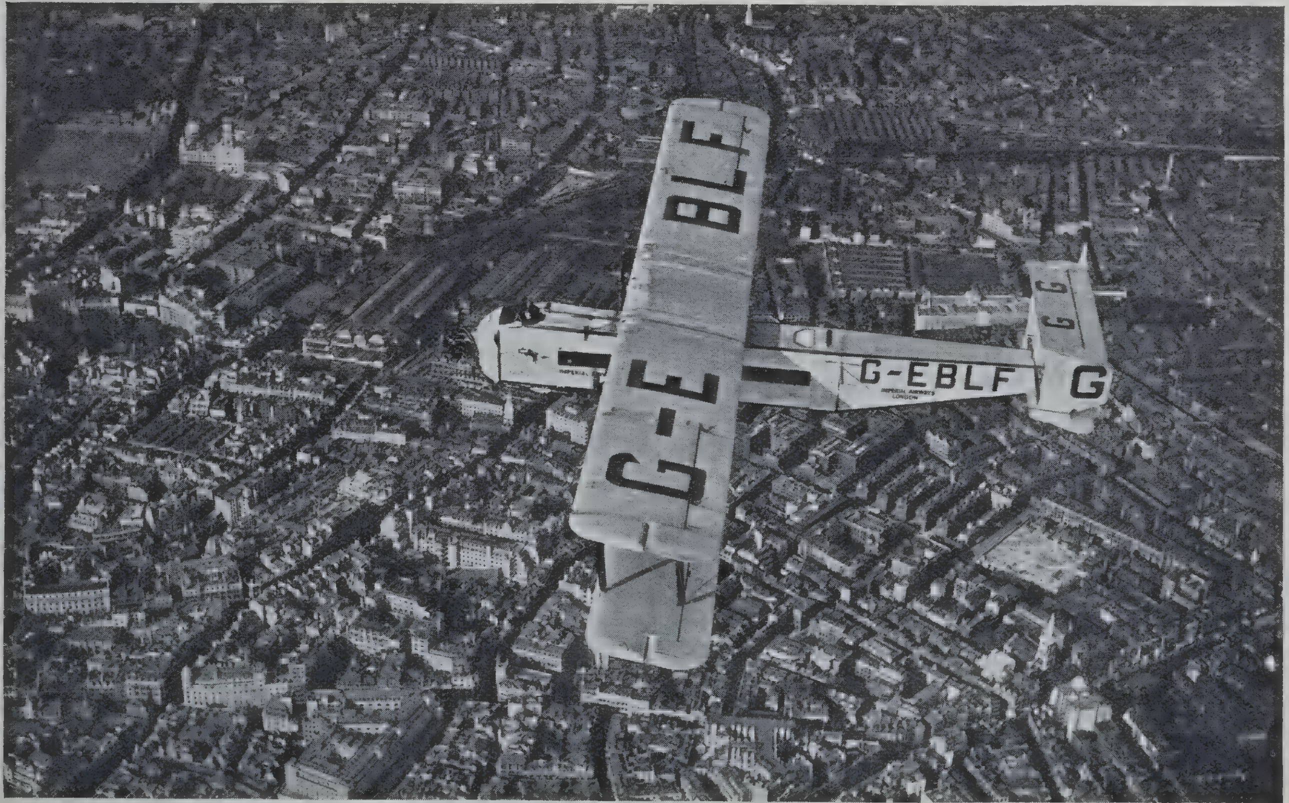


FIG. 78.—MAP OF DOCKLAND

Tilbury, which is 24 miles from the sea, is the great passenger depot. " The largest liners can be accommodated at any state of the tide, and a system of flood lighting enables passengers to be embarked or disembarked equally well by night as during the day."

London is, of course, by far the most important port in the country, and deals with more than one-third of our total foreign trade. Its imports, which are mainly foodstuffs, and raw materials (wool, timber, rubber, etc.), form about 40 per cent. of the total imports of the country, while its exports, which consist largely of manufactured goods, comprise little over a quarter of our total exports.



(*Imperial Airways*)

FIG. 79.—AIR VIEW OF DISTRICT AROUND LIVERPOOL STREET STATION, LONDON

EXERCISES

1. The following table shows the total value of the ocean trade of our six greatest ports :

Port.	London.	Liver-pool.	Hull.	Man-chester.	South-ampton.	Glasgow.
Trade (million £'s)	604	351	88	76·3	76·2	70

On an outline map of the British Isles draw in the sea near these ports " steamers " roughly proportional in length to the value of the ocean trade of each.

2. " Into London's docks come commodities from every land between the poles and the equator—sugar and rum from the West Indies, frozen meat from Australia and New Zealand, timber from Scandinavia and the Baltic, furs from Canada and Russia, carpets from Turkey, Persia and China, blocks of marble from Italy and Asia Minor, shells from the Southern Seas, teas and spices from China and the East Indies, ivory from Africa and India, rubber from Java and Singapore, wine from France, Spain and Portugal, odorous drugs from Ceylon and the Malaccas " (Pamphlet published by the Port of London Authority).

On an outline map of the world name the above countries and mark the sea-routes from them to London.

3. From the following figures draw two graphs to show the percentage of (*a*) British imports, and (*b*) British exports dealt with by London :

% of Britain's Total of	1900	1905	1910	1915	1920	1925	1930
Imports . .	33·6	32·0	33·7	39·6	33·7	37·7	41·0
Exports . .	25·8	25·5	24·7	32·9	22·7	26·7	26·7

CHAPTER XIII

SCOTLAND

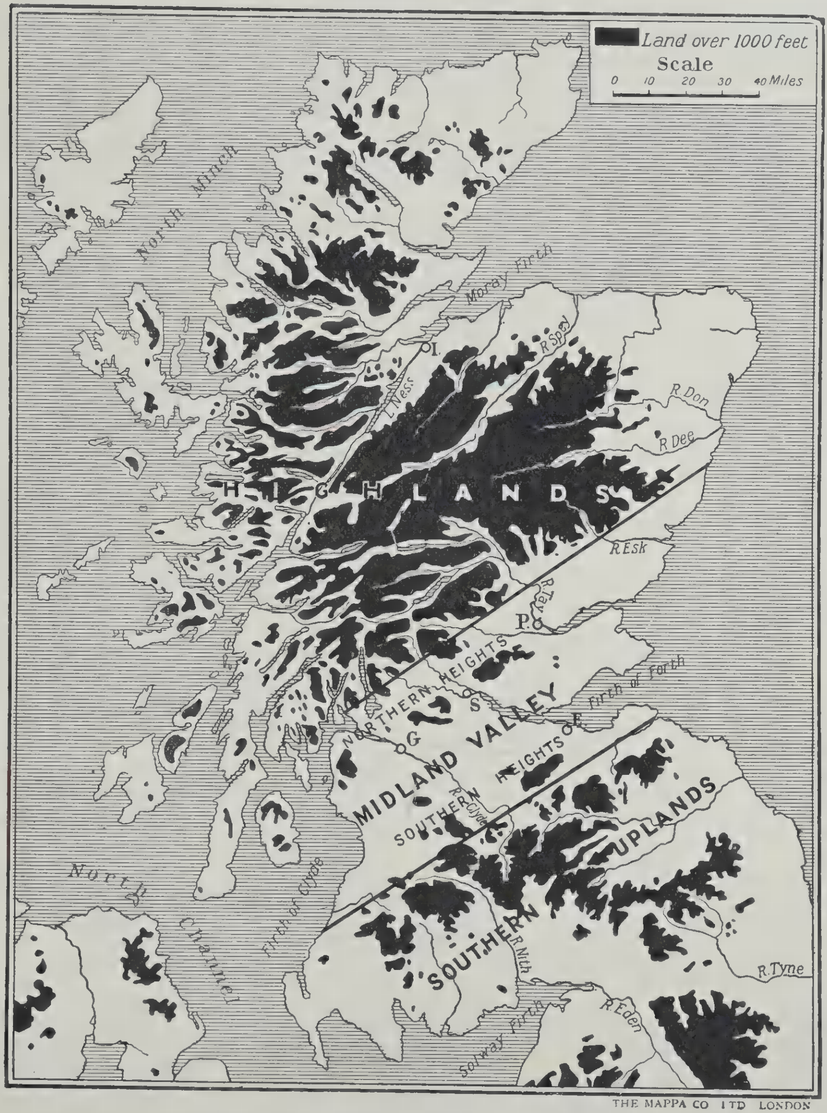
The mainland of Scotland can be divided into three sections as shown in fig. 80. Two of these—the Northern Highlands and the Southern Uplands—are mountainous, but the third—the Central Plain—is a fertile and thickly peopled lowland.

THE SOUTHERN UPLANDS

Though the uplands of southern Scotland have a beauty of their own they have none of the rugged grandeur of the mountains of the Lake District or of North Wales. In place of jagged peaks and precipitous mountain-sides, the tourist sees a succession of rounded hills, rising to more or less the same height. The hills have, indeed, been carved out of a plateau, and their summits were smoothed by the glaciers which swept over them during the Ice Age.

Long ago, a good deal of the land was forested, but now woods are to be seen only in the " dales," as the steep-sided valleys are called. Throughout the upland region sheep rearing is the chief type of farming. On the higher lands the hardy black-faced sheep graze on the coarse brown grass and heather which clothe the hills to their very summits. The more valuable, but less hardy, white-faced Cheviot sheep are found in the dales, where the more nutritious green grass grows.

As a single sheep requires from two to five acres of pasture the sheep farms are always large ; on the hilly land most of them exceed two square miles in area and there are many which are four times this size. It is not surprising,



THE MAPPA CO LTD LONDON

FIG. 80.—SCOTLAND. PHYSICAL

therefore, that southern Scotland is one of the most thinly peopled districts in Britain, although it is by no means a barren region.

It will be seen from the physical map that there are fairly large areas of lowland on the western and eastern sides of southern Scotland. These are, naturally, the richest farming districts. They vary considerably, however, in the type of farming carried on. The western coastal plain, especially in the counties of Ayr and Wigtown, is a great dairy-farming region, while the Tweed Basin, in the counties of Berwick and Roxburgh, is more noted for arable farming. The reason for the difference is that the western coastal plain has a much wetter climate than the Tweed Basin, which is in the "rain-shadow" of the Southern Uplands.

THE WOOLLEN INDUSTRY OF THE TWEED BASIN

In the days when woollen and other mills were run by water power the basin of the Tweed had great advantages as a woollen manufacturing area—it had the raw material, abundant water power, soft water for washing the wool, and hard-working people who had long been accustomed to hand-weaving. The patterns of the cloth woven were based on those which had long been used for shepherds' plaids, and the cloths themselves were called "tweels." It is said that this name became changed to "tweeds" through the error of an English clerk, who apparently thought the name of the cloth should be the same as that of the district in which it was manufactured.

Though the Tweed Basin was well equipped for manufacturing woollen goods in the early days of the industry, it was seen to have one great disadvantage when steam-engines were introduced. There is no coalfield in southern Scotland and all the coal for the factories has to be brought a long distance by rail. This, of course, adds to the cost of the product; so the manufacturers began to specialise in making high-quality suitings of distinctive pattern. They have thus been able to keep their industry going in face of the competition of the better-equipped woollen manufacturing area in the West Riding of Yorkshire.

The chief woollen towns in the Tweed Basin are Galashiels, Peebles and Selkirk, while Hawick specialises in the manufacture of woollen hosiery.

THE RAILWAYS OF SOUTHERN SCOTLAND

If we compare a railway map with a population map, we see that southern Scotland has far more railways than the number of inhabitants would warrant. The reason is that the Southern Uplands cut off the densely peopled Central Valley of Scotland from England. Consequently several main lines of railway have been built through the region. Fortunately, the valleys afforded considerable assistance to the engineers in the planning of these railways. Indeed, there are few districts where the valleys have so clearly determined the course of the railways as in southern Scotland.

The following routes should be followed out on the physical map in the atlas :

The London and North-Eastern Routes, *viz. :*

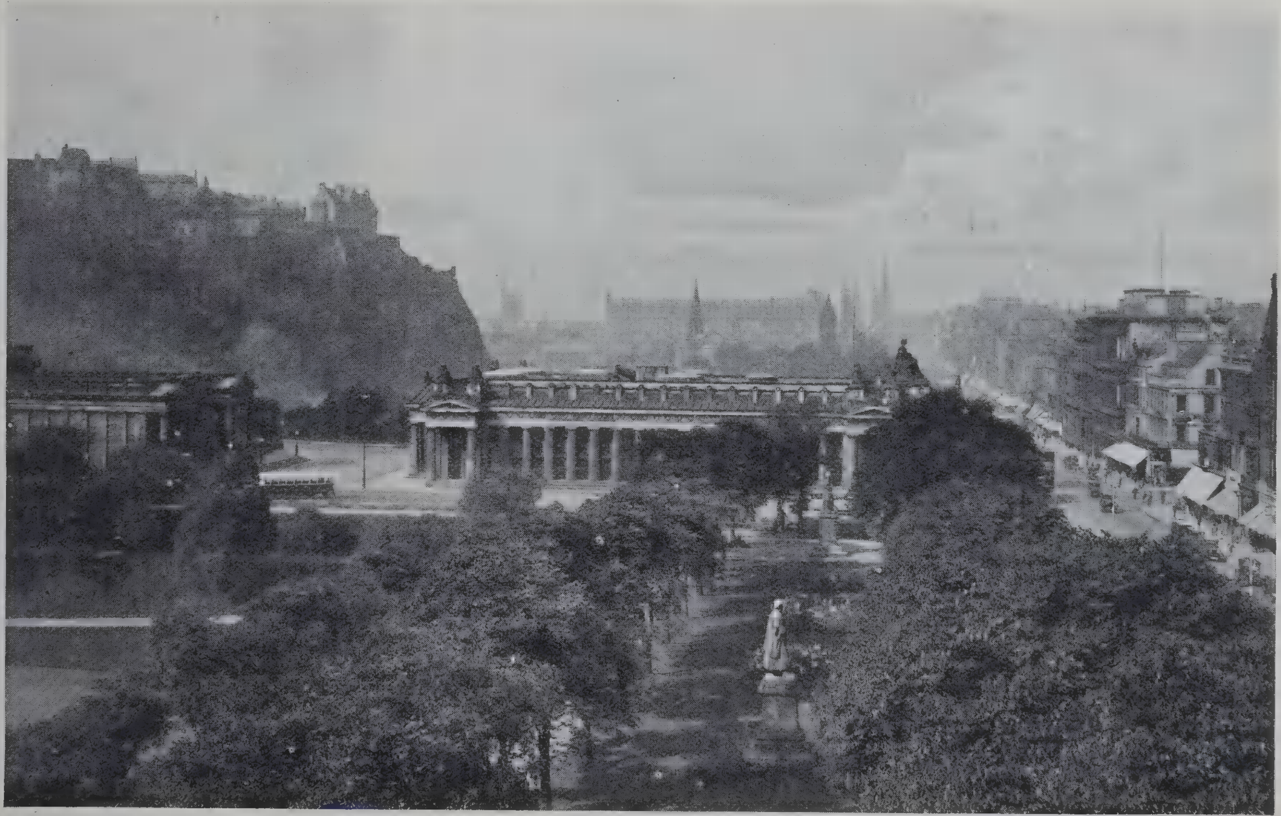
(1) *The East Coast Route*, which follows the eastern coastal plain from Berwick, through Dunbar to Edinburgh. This is the route followed by the " Flying Scotsman."

(2) *The Waverley Route*, which runs from Carlisle and follows the valleys of the Liddel, the Teviot and the Gala on its way to Edinburgh. The route gets its name from the fact that it passes through the district about which Sir Walter Scott wrote in his Waverley Novels.

The London, Midland and Scottish Routes, *viz. :*

(1) *The Caledonian Route*, which runs from Carlisle, up the valley of the Annan and down the valley of the Clyde to Glasgow.

(2) *The South-Western Route*, which runs from Carlisle, through Dumfries and Kilmarnock, to Glasgow, crossing the Southern Uplands by the valley of the Nith.



(L.M.S. Rly.)

FIG. 81.—EDINBURGH

(3) *The South Coast Route*, from Carlisle, along the southern coastal plain to the packet stations of Stranraer and Port Patrick, whence fast passenger steamers ply to Belfast and Larne in Northern Ireland. This route should be compared with those which follow the northern and southern coastal plains of Wales.

THE CENTRAL VALLEY

This section of Scotland is even more clearly marked off from the rest on a population map than on a physical map. On the former, it shows up very clearly as the only large, densely peopled part of Scotland. It is, indeed, about thirty-five times as densely peopled as the other divisions of the country.

The reasons why so many people are crowded in this small area are very clearly shown by the atlas maps. The Central Valley is the largest area of lowland in Scotland, and is therefore the chief farming region ; it is the only part of Scotland which has coalfields, and so it has become by far the most important manufacturing region ; it is the only part where long, deep estuaries reach far into the lowland, and so the only large ports of Scotland have grown up on its shores.

Central Scotland owes all these characteristics to the fact that it is a broad " rift valley," formed by the land slipping down between parallel faults as shown in fig. 83. The northern fault runs from Helensburgh on the Firth of Forth to Stonehaven on the east coast, while the southern fault runs from Girvan in the west to Dunbar in the east. Both these faults are shown by remarkably straight lines on the geological map, but only the northern one can be clearly traced on a physical map.

When the rift valley was formed the land which slipped down between the faults was crumpled up a little, as shown in fig. 83. One of the folds can still be traced in the line

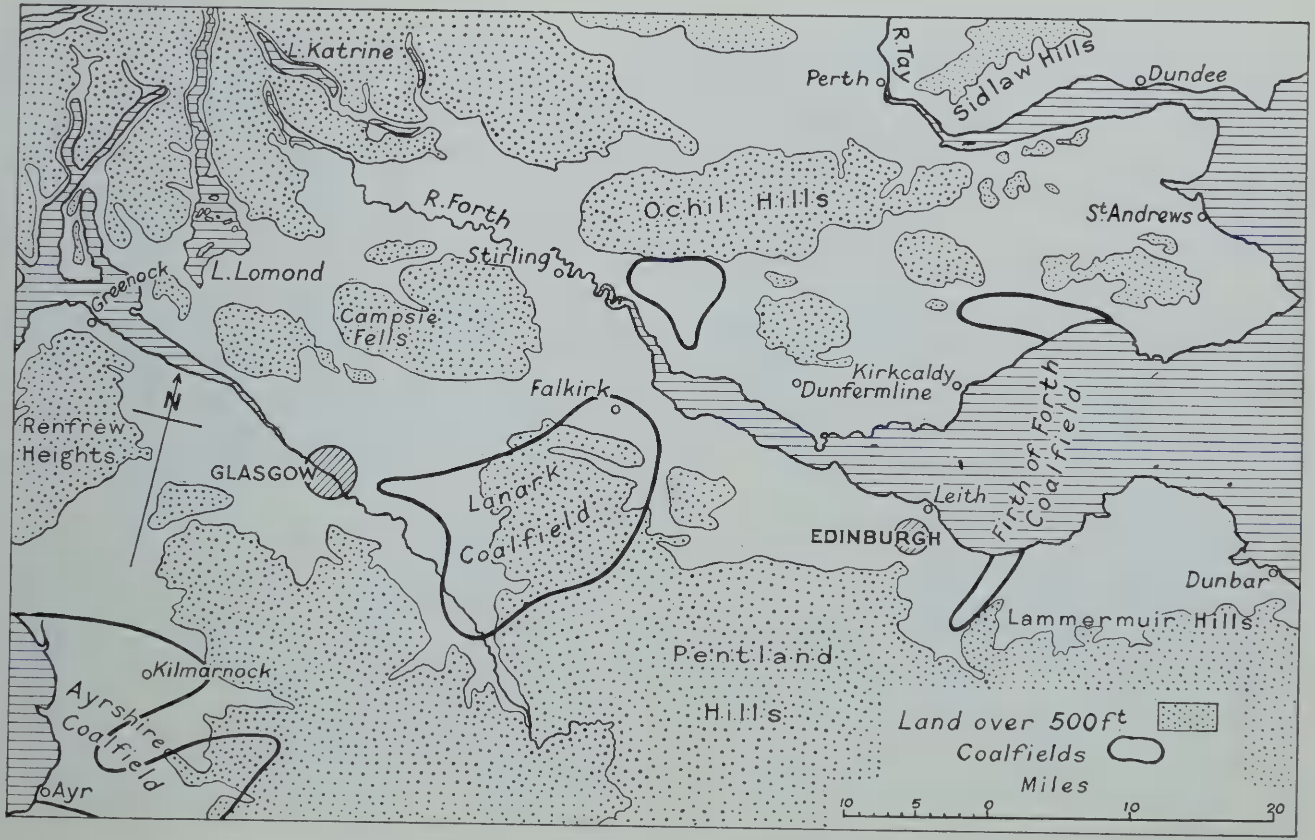


FIG. 82.—THE MIDLAND PLAIN OF SCOTLAND

of heights of which the Lennox Hills, the Ochil Hills and the Sidlaw Hills are parts. Between this fold and the edge of the Highlands is the broad vale known as *Strathmore*.

Another effect of the crumpling is seen in the form of the coalfields, in each of which the coal-seams are bent downwards in the form of a basin. It is to this basin-like structure that the coalfields owe their preservation. Had they not been so folded most of the seams would probably have been worn away by the weather, just as they have been from the parts between the basins.

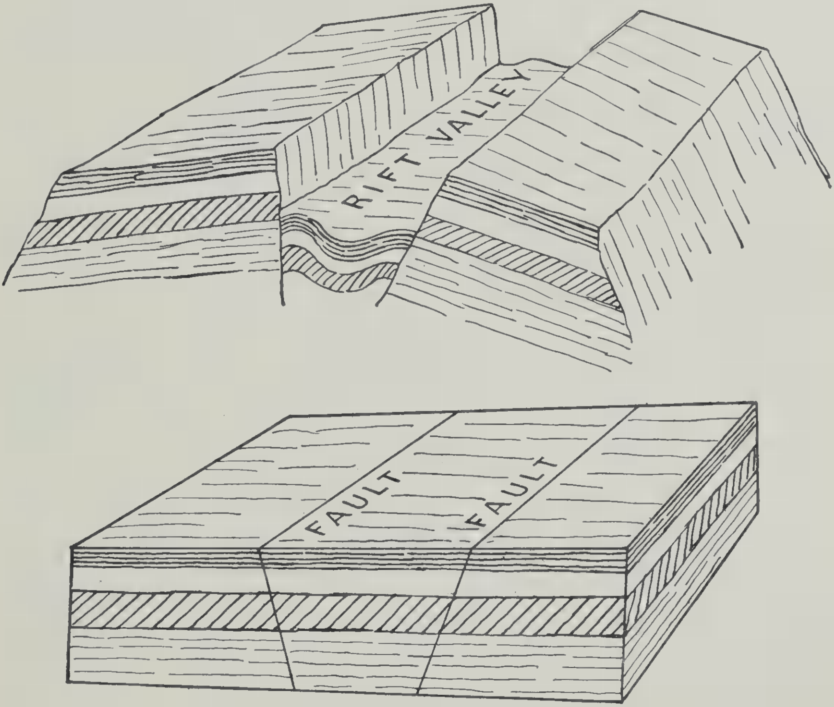


Fig. 83.—Rift Valley

FARMING IN THE CENTRAL VALLEY

Just as in southern Scotland, so in the Central Plain, the western and eastern sides differ somewhat in the kinds of farming carried on. In proportion to its area, Fife, for example, has more arable land, more wheat land, more sheep and fewer cattle than Renfrew. The chief cause of these differences is that Renfrew, which is exposed to the south-westerly winds from the sea, has a much heavier rainfall than Fife, which is somewhat in the rain-shadow.

As in all other parts of Scotland, the chief cereal grown in the Central Valley is oats. This crop will ripen even where the climate is quite damp and cool. Fortunately oatmeal is a very sustaining, if not a very appetising food, so that in the days when people had to live on the food grown in their own district, the Scottish people fared quite well on their porridge and oatcake.

Fruit growing is important in certain parts of eastern Scotland, notably around *Blairgowrie* in the Tay valley, where huge quantities of raspberries are grown, and in the *Carse of Gowrie*, which lies between the Sidlaw Hills and the Firth of Tay.

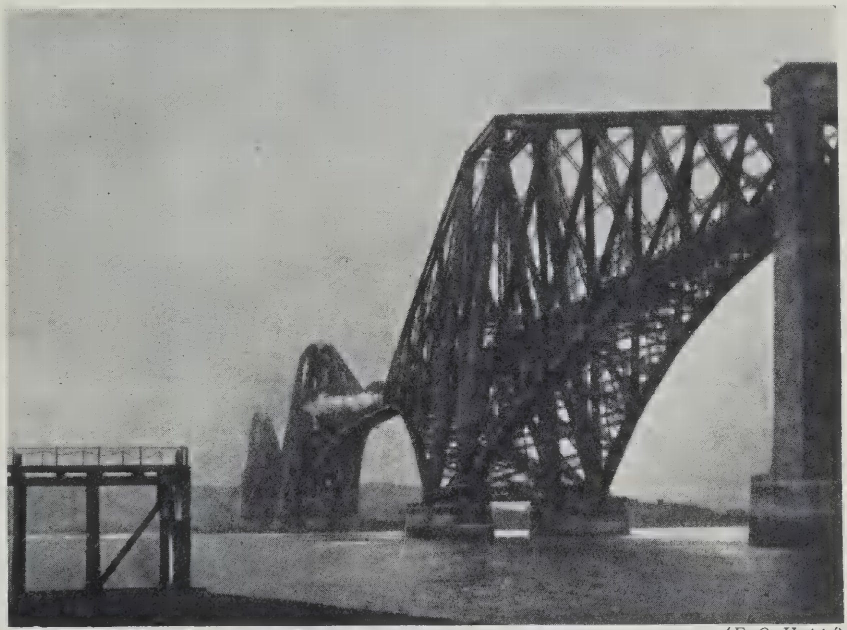
COALFIELDS AND MANUFACTURES

Of the three coal-mining areas of Scotland the **Central** or **Lanark Coalfield** is by far the most important. A good deal of the coal mined in this " field " is used in the iron and steel industries at such great engineering centres as Glasgow and Falkirk.

The Ayrshire Coalfield, which seems on the map to be nearly as important as the Lanark coalfield, produces only about one-fifth as much coal as the latter area.

The Firth of Forth Coalfield produces about a third of Scotland's coal. The coalfield is divided in two by the Firth of Forth, but the seams continue under the sea, so linking up the two halves. Some of the mines on both sides of the Firth extend well under the sea, and after storms the shores are sometimes strewn with lumps of coal washed up from submerged seams. About half of the coal mined in this area is exported.

The Clyde Valley is the greatest manufacturing area in Scotland. It has the advantages of local coal and iron ore and of a sheltered, deep-water estuary which has encouraged the development of trade. *Engineering* is carried on in Glasgow and Motherwell, while *shipbuilding* is the most important industry in towns such as Dumbarton and Greenock, on the Clyde estuary. About one-third of the ships built in the British Isles are launched in the Firth of Clyde. *Cotton manufacturing* is carried on in Paisley, which specialises in the manufacture of cotton thread. The Clyde valley has all the same natural advantages as Lancashire for the manufacture of cotton goods—supplies of coal and iron, a good port facing America, and a damp climate. Indeed, it seemed at one time as if cotton manufacturing would become its chief industry, but men found it easier just then to make



(*E. O. Hoppé*)

FIG. 84.—THE FORTH BRIDGE

money from the iron and steel industry, so that cotton manufacturing was neglected.

Sugar refining is an important industry in Greenock, where it developed in the early days of trade with America.

The Firth of Forth has manufacturing towns on both banks. On the southern side is Edinburgh, which manufactures machinery, clothing and paper. On the northern side are Dunfermline and Kirkcaldy. The former manufactures linen goods and the latter is the chief centre in the British Isles for the manufacture of linoleum.

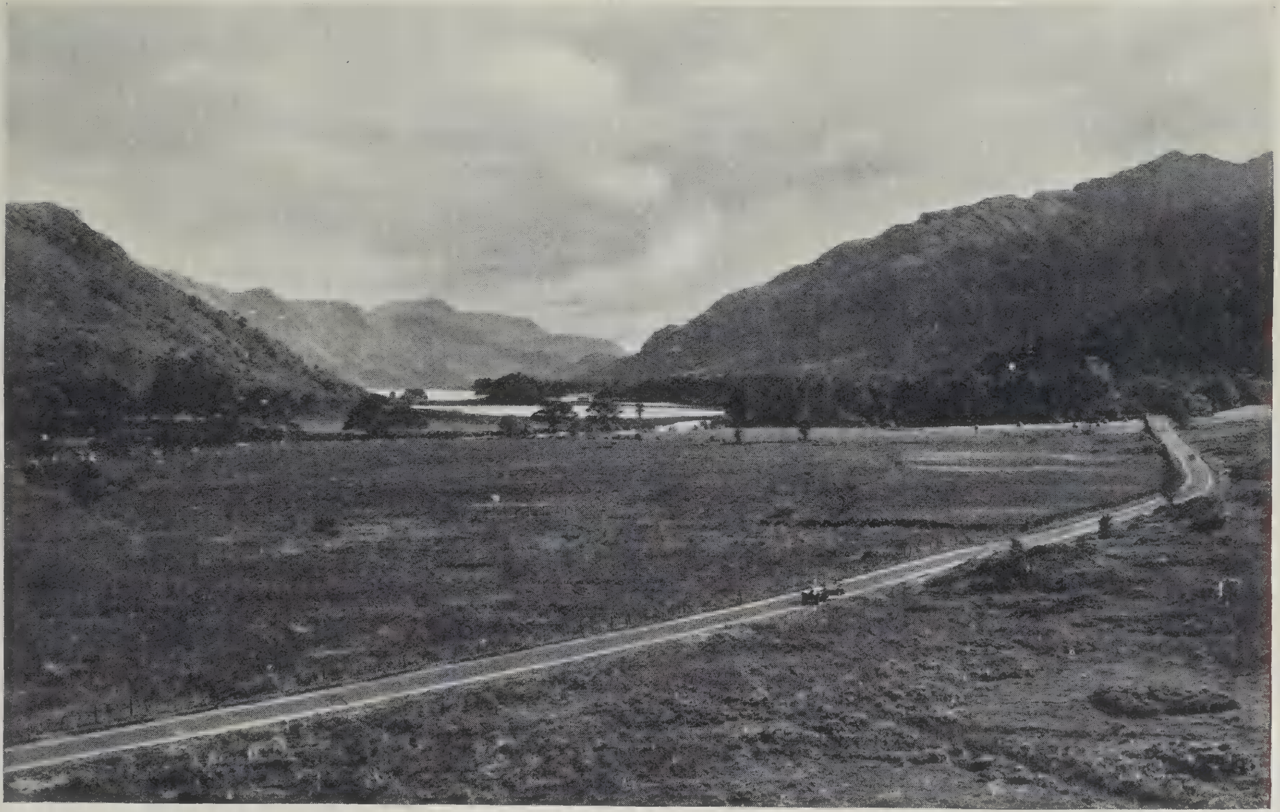
On the **Firth of Tay** the chief city is Dundee, which is famous for the manufacture of sacking and marmalade. Both these industries sprang out of others which in their turn developed because of things grown locally. Long ago flax was grown in the district, and so linen manufacturing began. A good deal of flax was also imported from Russia, but these supplies were cut off during the Crimean War. The Dundee manufacturers therefore began to experiment with jute, which could easily be obtained from India. They were so successful that most of them never manufactured linen again, and Dundee now produces about one-seventh of the world's jute cloth.

The manufacture of marmalade grew out of the jam-making industry which depended on the fruit grown in the Carse of Gowrie.

FAMOUS CITIES OF THE LOWLANDS

Edinburgh grew up round the Castle Rock, which commands the east coast route from England. As it was the " key " to the lowlands, it was made the capital, and from that time grew in importance as the country prospered. Its port, **Leith,** exports a good deal of coal and imports dairy produce and timber.

Glasgow grew up at the head of navigation of the Clyde, where the routes converged to a ford by which the river could

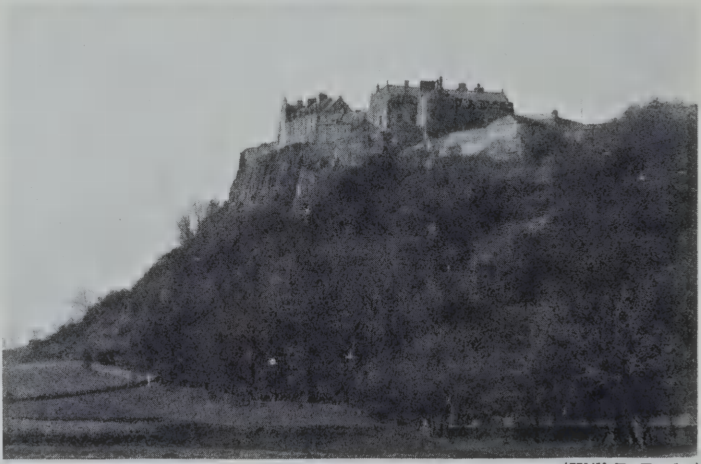


(*L.M.S. Rly.*)

FIG. 85.—GLEN FALLOCH AND THE HEAD OF LOCH LOMOND

be crossed at low tide. Later, bridges replaced the ford, and so Glasgow became still more important as a road centre. It was, however, not of much importance as a port until the river bed was deepened by blasting away a huge quantity of rock which blocked the channel. Now it is the second largest city and the sixth port of Britain.

Dundee first became important as a whaling port, and though this industry is now dead, the port is still one of the chief fishing stations of Scotland. The building of the Tay Bridge made Dundee a railway centre, and so helped the growth of the industries which have been mentioned above.



(*Will F. Taylor*)

FIG. 86.—STIRLING CASTLE

Perth and **Stirling** are in very similar positions. They are situated on the Tay and the Forth respectively, where these rivers break through the hills which separate Strathmore from the rest of the Central Valley. Each is situated at what was formerly the lowest point on the river at which a bridge could be built. For this reason each became an important road centre and a market town.

Perth was the capital of Scotland until 1437, and is now noted for its dye-works, which grew up there partly because the waters of the Tay are specially suitable for use in the industry.

Stirling gained added importance in early days because of its great crag which stands out above the plain, making a suitable site for a castle which could guard the way to the Highlands. Around it many battles have been fought, including that of Bannockburn, in which the English were so disastrously defeated in 1314.

" Stirling is the twin brother of Edinburgh. . . . Edinburgh is like an old soldier who has entered public life ; Stirling is like an old soldier living in a house full of the trophies of his youth."[1]

EXERCISES

1. The fastest " Scottish " train runs from Thornhill, near Wakefield, *via* Skipton and Carlisle to Dumfries, at an average speed of 53·3 miles per hour.

Draw a sketch-map to show its route.

2. Draw sketch-maps to show the railways which converge on (*a*) Glasgow, (*b*) Edinburgh.

Put in the high land to show why the railways follow particular courses.

3. Refer to the list of factors which determined the development of the cotton industry in Lancashire, and copy those factors which apply equally well to the Clyde basin. What reasons can you give for the fact that there is not nearly so much cotton manufacturing in the Clyde basin as in Lancashire ?

CHAPTER XIV

NORTHERN SCOTLAND

The Central Plain of Scotland ends abruptly at the fault which marks the north-western boundary of Strathmore.

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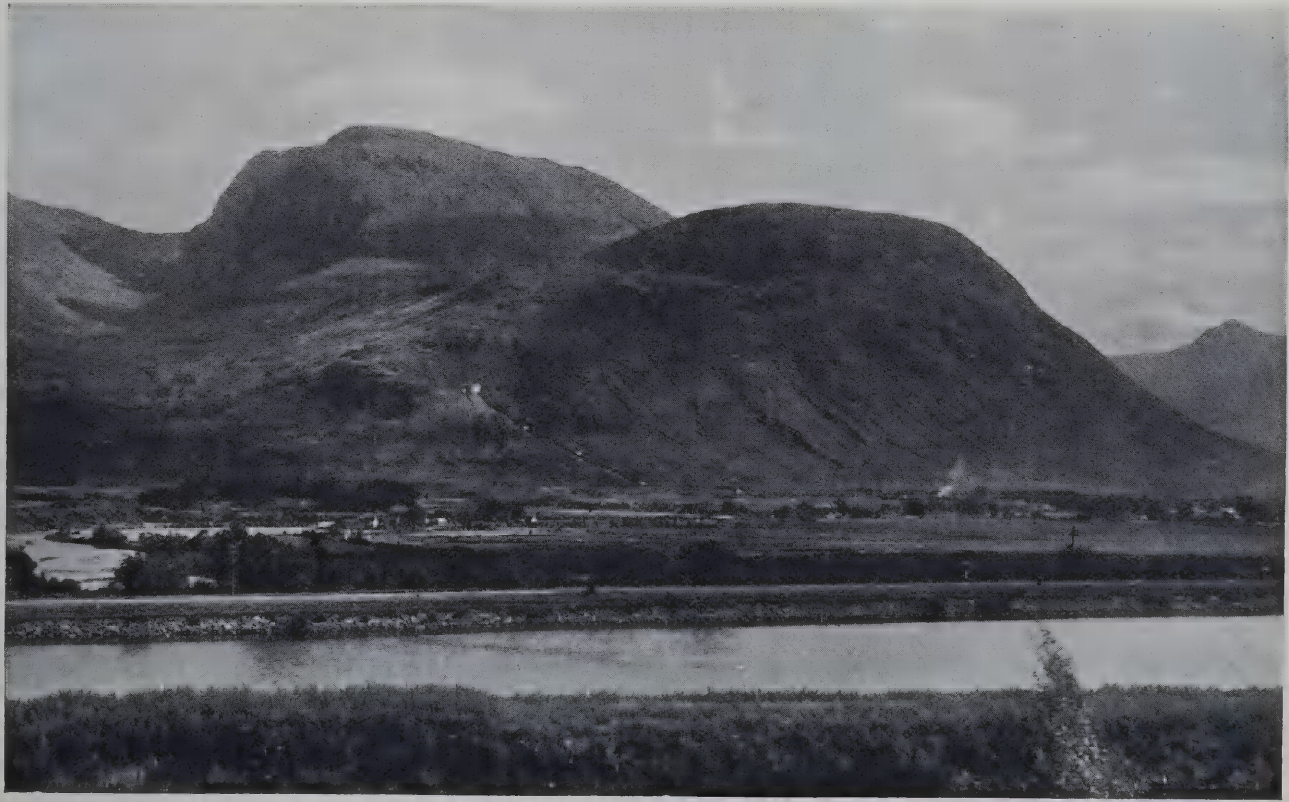
[1] H. V. Morton, *In Search of Scotland.*



(*Will F. Taylor*)

FIG. 87.—BEN NEVIS

Hardly anywhere else in Britain do the scenery and the way of life of the people change so rapidly as when one passes from the pleasant lowland of Strathmore to the grim highlands which frown over its northern edge.

Ages ago northern Scotland was a plain which the weather had worn down almost to sea level. Then the land was uplifted to form a plateau. During this process the rock broke up into great blocks, separated by cracks which have since been widened and deepened to form the picturesque " glens " for which the Highlands are famed. It is such a long time since the Highlands were uplifted that had they been composed of soft rock they would have been again worn down almost to sea level. It happens, however, that the rocks are almost the oldest and hardest known in any part of the world. Consequently they still stand out, in defiance of frost, rain and wind, as the highest mountains in the British Isles. Ben Nevis, the highest of all, is 4,406 ft. high, and its summit is only just below the limit of perpetual snow.

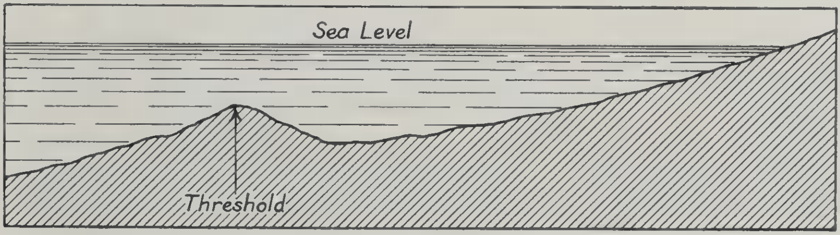


FIG. 88 (*a*).—SECTION ALONG A FIORD

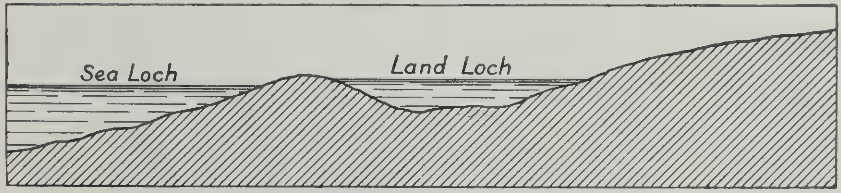


FIG. 88 (*b*).—SECTION ALONG SCOTTISH LOCHS

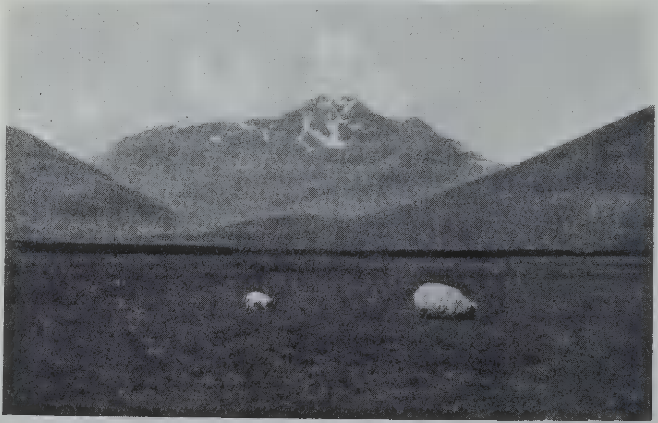
It will be seen from the map that many of the valleys of the Highlands are occupied by long, narrow lakes called lochs.

Most of them lie in hollows which were scooped out by glaciers during the Great Ice Age. Often the lochs are separated from the sea only by a narrow strip of lowland, as shown in fig. 88 (*b*). It is interesting to compare a section along such a loch with the section along the bed of a Norwegian fiord. The "threshold" which nearly always marks the entrance to a fiord corresponds to the isthmus which shuts off the loch from the sea. If the coast of Scotland were to sink a little more, land lochs and sea lochs would join to form fiords exactly like those of Norway.

As most of the glens of Scotland are very steep sided, there are many high waterfalls. Some of these are now used to generate electricity, which is used chiefly for the smelting of aluminium ore. The chief hydro-electric stations are near Fort William and Fort Augustus.

THE LIFE OF THE HIGHLANDERS

The Highlands are so cold and wet and wind-swept that very little will grow there. Such hardy trees as Scots pine and silver birch are found in specially sheltered parts of the deep glens, but elsewhere trees are rarely seen. The moun-

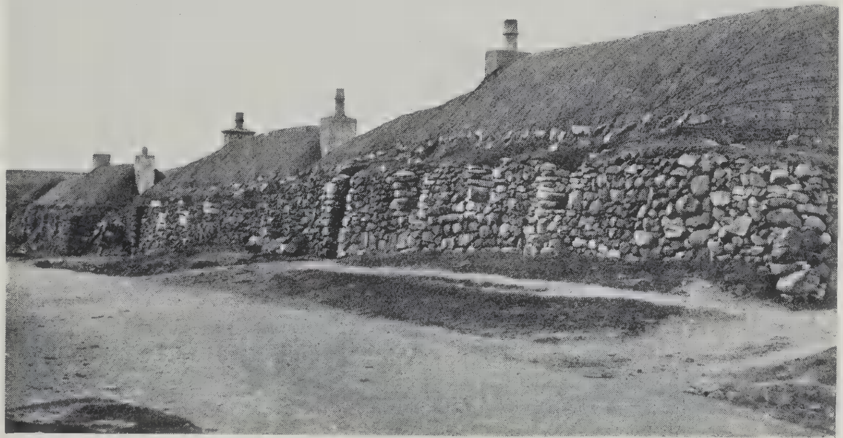


(*Donald Ross*)

FIG. 89.—SHEEP LANDS IN PERTHSHIRE

tains are covered with heather, bracken, or coarse brown grass, and in many parts there are large peat bogs. Good farming land is so scarce that the tourist wonders, not at the scarcity of inhabitants, but how anyone can wring a livelihood from such tiny fields as are to be seen here and there in the valley bottoms.

Sheep rearing is, of course, one of the chief types of farming, but the pasture is so scanty that the sheep farms have to be very large indeed, and the low stone-built cottages of the shepherds are very widely separated.

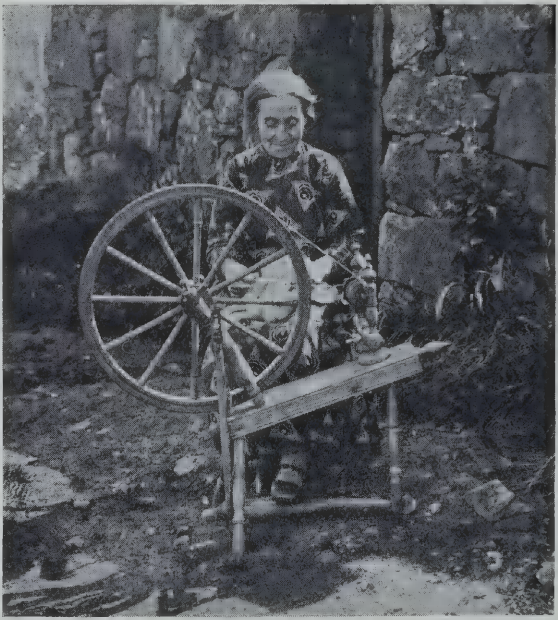


(*Topical*)

FIG. 90.—CROFTERS' COTTAGES

In recent years large parts of the Highlands have been bought by wealthy men who reserve them for grouse-shooting and deerstalking.

In the north-west, especially where the glens run down to the sea, there are many little farms which are known as "crofts," the people themselves being called "crofters." Each family has one or more tiny fields on which oats, potatoes and hay are grown, as well as a large area of barren mountain land, on which a few sheep can be kept in summer. No matter how hard the crofter and his family work, they can scarcely produce enough from the land to keep them alive, and so the men often go out fishing while the women and children look after the farm. Though this helps to provide food, it seldom brings in any money, for there is no way of getting the fish to a " market." The people are, therefore, desperately poor, and have to be content with what they can produce themselves. Fish, oatcake, porridge and potatoes form their diet ; cloth is woven in the home from wool shorn from the local sheep, and their only fuel is peat dug from the neighbouring hills. In the Hebrides the women weave in their homes the Harris tweed which southerners prize for its softness, warmth and durability. Even for this work they seldom obtain any money, but only " credit " for groceries to be obtained at the village store.



(*Central Press*)

FIG. 91.—SPINNING AND CARDING WOOL IN THE HEBRIDES

NORTH-EASTERN SCOTLAND

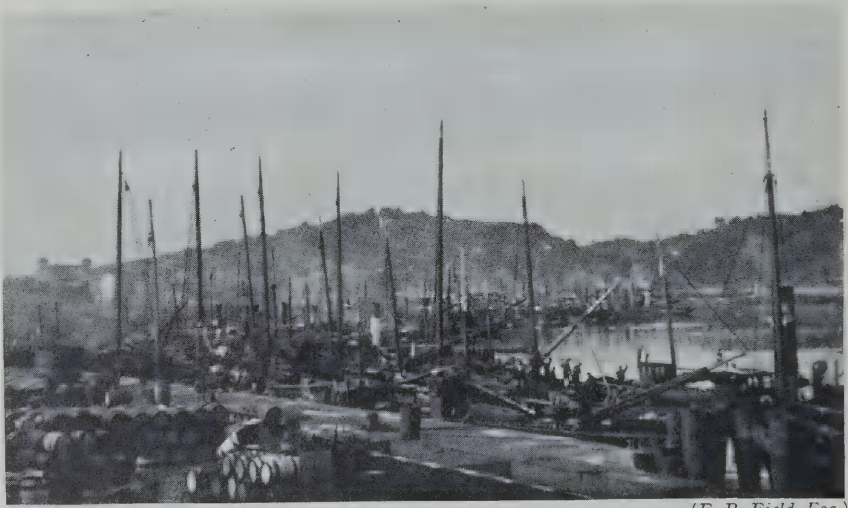
The atlas maps show that there are great differences between the eastern and western sides of northern Scotland. On the west the mountains rise up directly from the rugged indented coast, whereas on the east the coast is little indented and is backed by a fairly level coastal plain. A geological map shows us that the eastern side is composed of younger and softer rocks than the western side. Climatic maps show us that the eastern coastal plain is drier and sunnier than the west. A population map shows us that there are far more people on the eastern side than on the western side, and economic maps show us that the east has much more arable land and far more cattle and sheep than the west.

Cattle rearing is the chief type of farming, and the Aberdeen Angus and Shorthorns are well-known breeds of cattle. Fishing is also an important industry, not only at the larger ports such as Aberdeen, Fraserburgh and Peterhead, but also at many small villages along the whole coast.

Aberdeen first grew up around the mouth of the Dee, but now occupies nearly all the area between the estuaries of the Dee and the Don. It is often called " the Granite City," since most of the houses are built of the grey granite which is quarried locally. As we have seen, it is an important fishing station ; it is also the chief commercial port of northern Scotland, and has many factories engaged in the manufacture of linen, jute, paper, etc.

Inverness is situated where the road along the coastal plain crosses the *Caledonian Canal*, which joins the lakes lying in the great trough known as *Glenmore*. The canal was constructed more than a hundred years ago to enable ships to get from the Atlantic to the North Sea without going round the north of Scotland and through the stormy Pentland Firth. It has, however, never been much used by cargo vessels, since it can accommodate only very small steamers, and is now used only by fishing vessels and by tourist steamers.

Thurso and **Wick** are small fishing ports situated in the extreme north-eastern corner of Scotland. They are the northern termini of the Highland Railway, which crosses the Grampians to Inverness by way of the valleys of the Tay and the Spey, and then follows the eastern coastal plain.



(*F. B. Field, Esq.*)

FIG. 92.—THE HARBOUR AT STORNOWAY, THE CHIEF TOWN OF THE OUTER HEBRIDES

The Orkney Islands are composed of soft, red rocks similar to those which are found in the north-east corner of the mainland of Scotland, and so nearly all the people are farmers.

The Shetland Islands, on the contrary, are made of hard, old rocks like those of western Scotland. Consequently the soil is much less fertile than in the Orkneys, and there are fewer farmers and more fishermen. The life of the Shetlanders is, indeed, very similar to that of the crofters of the Hebrides. The men fish and farm, and the women farm and knit. Shetland wool shawls, knit from home-spun wool, are famous for their lightness and softness.

EXERCISES

1. The county of Inverness has an average density of population of 20 per square mile, while Lanark has 1,800 per square mile.

Give as many reasons as you can for this difference.

2. Draw a sketch-map to show that Inverness is situated at the meeting point of several routes.

3. Give reasons why there are no large towns on the west coast of the Highland region of Scotland.

4. Sheep-rearing is the chief kind of farming carried on in Sutherland, as in other counties of the Highlands. Yet Sutherland has fewer sheep per square mile than Gloucestershire, which is not one of our most important sheep-rearing counties.

Give reasons for this difference.

CHAPTER XV

IRELAND

IRELAND is very often called the "**Emerald Isle**" because the prevailing colour of the landscape is green. Grass grows well in Ireland because the south-westerly winds, blowing straight from the Atlantic, bring heavy rainfalls to all parts, with the exception of a few sheltered districts near the east coast. The climate is not only wet, it is also mild and equable. The occasional "heat waves" of the English summer and the "cold spells" of winter do not often extend to Ireland, and hardly ever reach the south-western corner of that island. Valentia, in the extreme south-west of Ireland, is 6 degrees Fahrenheit warmer than London in January and 6 degrees cooler than London in July. Its range of temperature (*i.e.* the difference between the temperatures of the warmest and the coldest months) is only 15 degrees Fahrenheit, and even in Dublin, which has the most " extreme " climate of any Irish city, the range is only 19 degrees, whereas in London it is 27 degrees.

From the physical point of view Ireland is made up of detached bits of Great Britain (see fig. 93). The Highlands of Scotland are continued in north-eastern Ireland by the Sperrin Mountains and the mountains of Donegal ; the rocks of the Southern Uplands are similar to those which make up the Mountains of Mourne ; the Cambrian Mountains have their counterpart in the Wicklow Mountains ; and Exmoor is composed of the same kind of rock as the mountains of Kerry.

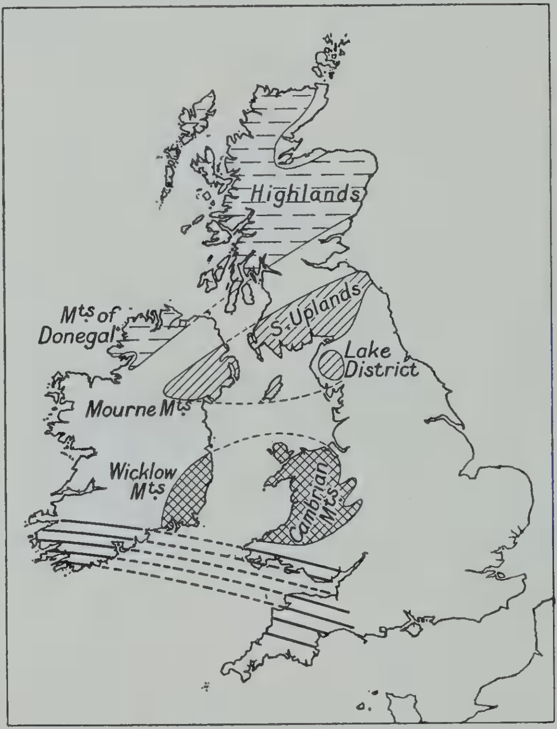


FIG. 93.—" IRELAND CONSISTS OF DETACHED PARTS OF GREAT BRITAIN "

It is, of course, a very long time since any part of Ireland was joined to Great Britain ; so long ago, indeed, that many animals which crossed from the Continent to England when the Straits of Dover were dry land were never able to get over to Ireland. It is for that reason and not, as the legend says, because St. Patrick drove them out, that Ireland has no snakes.

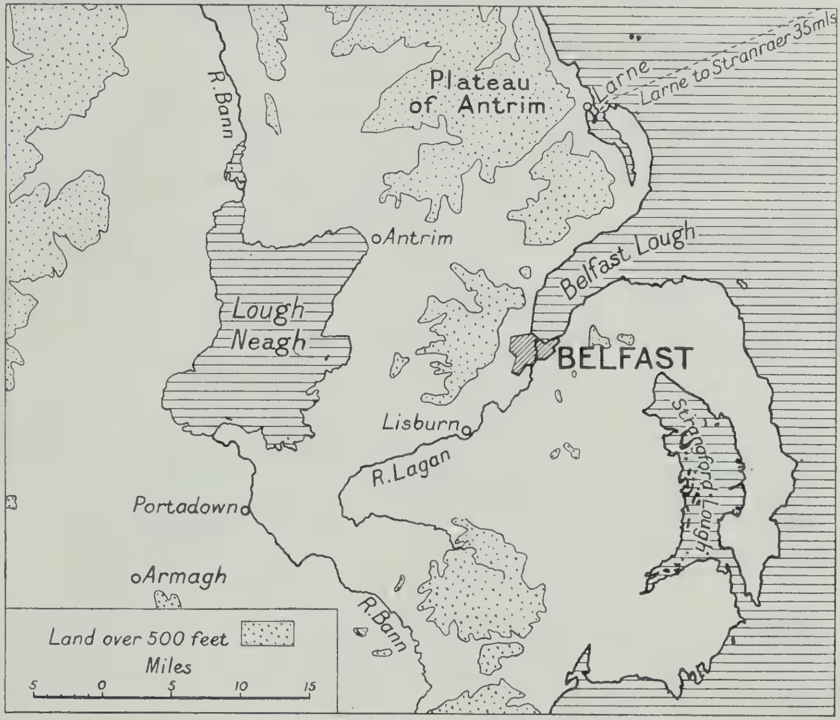


FIG. 94.—THE DISTRICT AROUND BELFAST

Politically Ireland is now divided into two countries—*Northern Ireland*, which is still a part of the United Kingdom, and still sends members to Westminster, though it has also a parliament of its own; and the *Irish Free State*, which is a self-governing Dominion within the British Empire, and which sends no representatives to our Parliament.

Northern Ireland consists of six counties, which formerly made up the greater part of that division of Ireland known as Ulster. These six counties differ from the rest of Ireland in being more fertile and more prosperous, and in the fact that the majority of the people are Protestants, who are descended from immigrants brought over from Scotland during the seventeenth century.

For many centuries there was a good deal of friction between the Protestants and the Catholics, and in 1922, when the rest of Ireland was granted Home Rule, the six counties which now compose Northern Ireland decided to remain part of the United Kingdom.

Though Northern Ireland has some important industries, the chief occupation of the people is farming. The best farm lands are the plains around Lough Neagh and south of Belfast Lough. Though the farms in these districts are generally small, they rear large numbers of cattle, pigs and poultry. Co-operative societies help the farmer to buy food for his stock at the lowest possible rates, and assist him in marketing the cattle, bacon and eggs which form the chief exports from Northern Ireland.

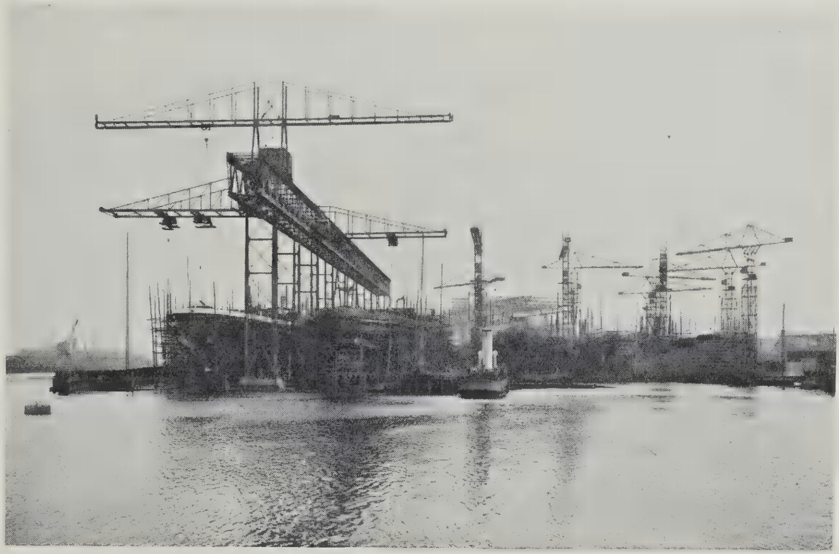
Two very important crops are potatoes and flax. The former is one of the chief foods of the people, and the latter is used for the manufacture of linen.

In the hilly districts the land is so poor that the farmers speak of "manufacturing the soil" when preparing it for crops. In such districts are still to be seen single-roofed cabins of turf or rough stone, which shelter both human beings and farm stock.

THE TOWNS AND INDUSTRIES OF NORTHERN IRELAND

Belfast, which contains nearly half a million people, is the capital of Northern Ireland and one of the chief ports and busiest manufacturing cities in the United Kingdom. Like Glasgow, it owes its importance as a port more to the skill of engineers than to the bounty of Nature. A hundred and fifty years ago the present harbour was merely a muddy creek with a depth of only $1\frac{1}{2}$ ft. at low water for three miles below Belfast, but in 1840 the river mouth was dredged and a new channel cut, by which large ocean liners may reach the heart of the city. On Queen's Island, which was reclaimed during the making of the harbour, are now situated some of the greatest shipyards in the world.

Another great industry of Belfast is the manufacture of linen from flax, a good deal of which is grown locally, though some has to be imported from Belgium and eastern Europe.



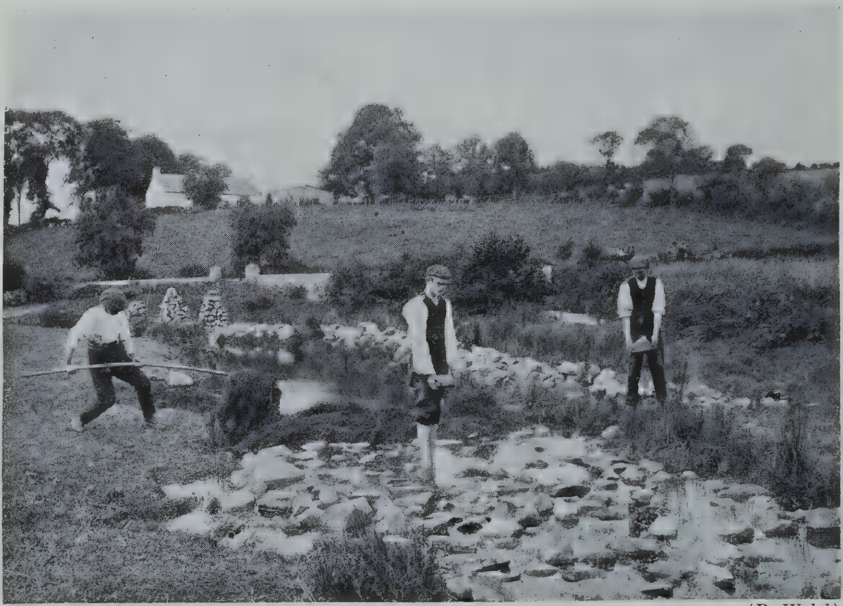
(*L.M.S. Rly.*)

FIG. 95.—SHIPBUILDING YARD, BELFAST

To obtain the fibre from which the linen weft and yarn are spun, the stems of the flax plant are first *retted* or rotted by soaking in water. After this the fibres which lie around the woody centre are separated by the process known as *scutching*. The raw flax is then sorted into different qualities and sent to the spinning mills, where it is made into weft and yarn, as in the case of cotton and wool.

A third industry, which seems to be a link between those just mentioned, is that of rope-making. The city is also famous for the manufacture of tobacco.

"Belfast boasts of having the biggest ship yards, the biggest spinning factory, the biggest tobacco factory (Gallagher's) and the biggest rope-works (Barbour's) that are in Europe."[1]



(*R. Welch*)

FIG. 96.—PUTTING FLAX IN THE DAM FOR RETTING

Lisburn, on the river Lagan some twelve miles above Belfast, has been an important linen-manufacturing centre since the days when William III encouraged the settlement there of skilled linen weavers who had been driven out of Flanders because they were Protestants.

Larne is the packet station to which boats ply from Port Patrick and Stranraer in south-western Scotland. It is the nearest Irish port to the mainland of Great Britain.

Portrush is a holiday resort on the north coast. Near by is **Giant's Causeway,** formed of rock which has split up into straight-sided columns. Ages ago there were great cracks from which welled hot, liquid lava of the kind known as *basalt*. As the lava cooled and solidified it formed a platform which extended into what is now Scotland. Most of the basalt platform has since been worn away by the weather and in the sea, but parts of it still remain in Antrim and in the islands of south-western Scotland. Columns of basalt, similar to those which make up Giant's Causeway, are also found in Fingal's Cave, on the Isle of Staffa in Scotland. They were formed by the rock shrinking and cracking as it cooled, just as the surface of a mud-bank or a builder's lime pit cracks when the material shrinks on drying.

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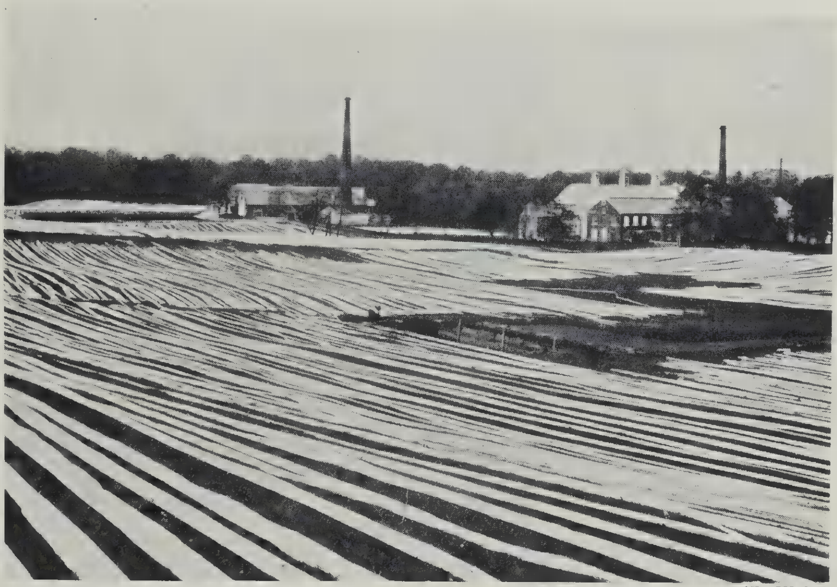
[1] Stephen Gwynn.



(*R. Welch*)

FIG. 97.—BLEACHING LINEN

Most of the columns are six-sided, though few are regular hexagons.

Londonderry is situated at the head of Lough Foyle. The Irish still call the town " Derry " ; the prefix " London " was added at the time of the Plantation of Ulster (1609), when certain merchant gilds of London bought a large tract of the best land of the country.

(L.M.S. Rly.)

Fig. 98.—GIANT'S CAUSEWAY

The chief industry is the manufacture of shirts and collars, approximately four million of the former and twenty million of the latter being made each year.

THE IRISH FREE STATE

It is not easy to divide Ireland into natural regions as we did in the case of England and Scotland ; but the Midland Plain separates the mountainous north-west from the equally mountainous south-west and south-east. In all these districts the chief occupation of the people is farming, but there are great differences in the fertility of the land.

In the north-west, especially in the county of Donegal (Tirconaill), life is so difficult that it is said " there are only two classes, namely, the poor and the destitute." The soil is so thin and the farms so small that although the women earn a little money by making tweed in their poverty-stricken homes, while the men add to the food supply by fishing, many of the people are constantly on the verge of starvation. In spite of the poverty of the land and the people, western Ireland has a charm of its own. " The little one-storeyed, white-washed cottages, with the tiny windows, the half doors and the thatched roofs that are often held in their place with rows of heavy stones hanging on cords from the eaves, blend delightfully with the landscape. The little white thatched house is, perhaps, the most distinctive feature of the Irish countryside, though cement and brick and slate

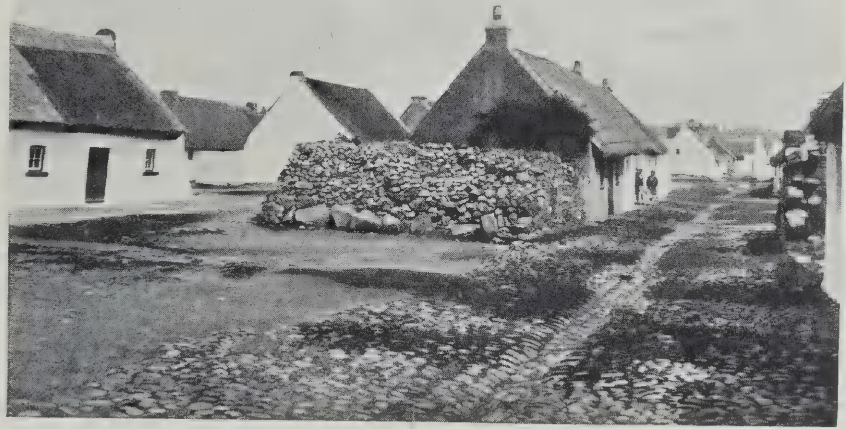

(L.M.S. Rly.)

FIG. 99.—VILLAGE STREET IN GALWAY

and even corrugated iron are every day introducing commonness where beauty once was."[1]

Galway, situated on one of the finest natural harbours in the British Isles, was an important port from the thirteenth to the seventeenth century. Now it is little more than a fishing station, and even in that respect it is of little importance, since it is so far from any great centres of population.

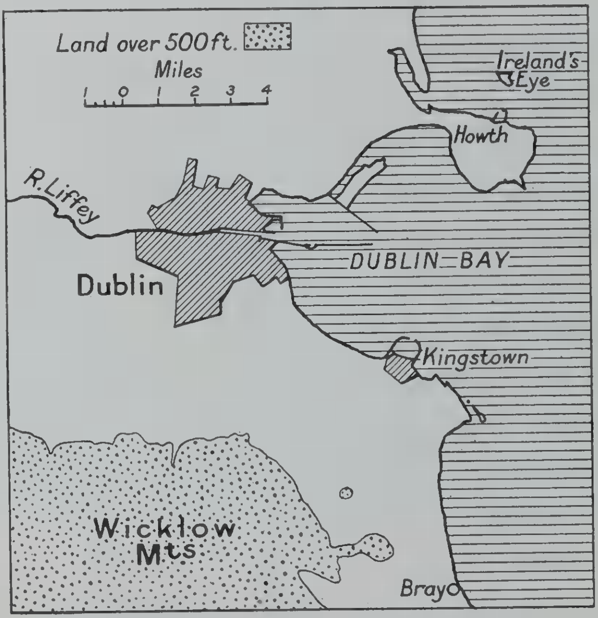


FIG. 100.—THE SITUATION OF DUBLIN

The Midland Plain of Ireland varies greatly from place to place. Near the east coast the land is fertile and the summers are warm and sunny ; consequently this is one of the best farming districts in the country.

On the strip of coast between the Mountains of Mourne and the Mountains of Wicklow are three ports—Dundalk, Drogheda and Dublin.

Dublin, formerly the capital of the whole of Ireland and

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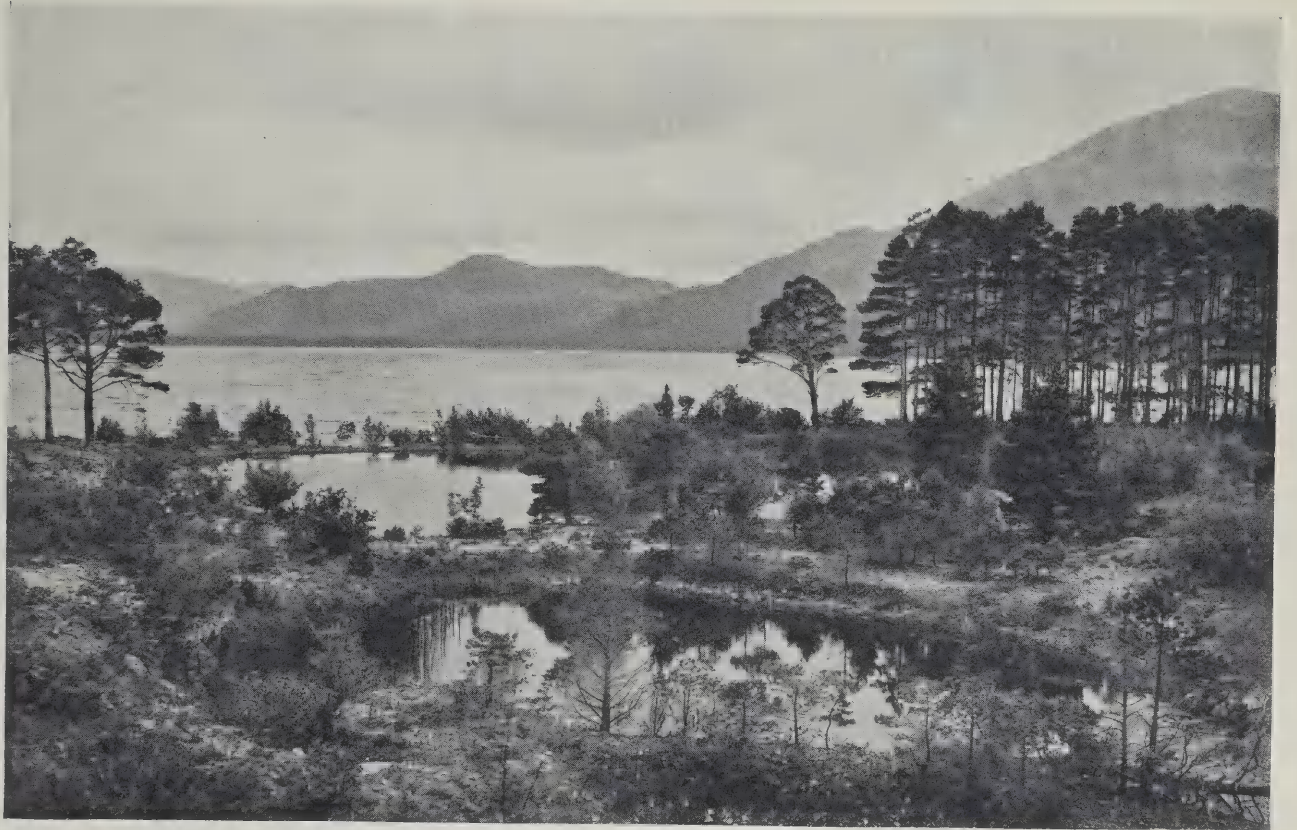
[1] Robert Lynd.



(L.M.S. Rly.)

FIG. 101.—LOUGH LEANE, KILLARNEY

the present capital of the Irish Free State, is situated at the lowest bridge-point on the Liffey, and at the head of navigation of the estuary.

It is the chief " gateway " of the Irish Free State and from it roads, railways and canals lead to all parts of the country. Like Belfast it is a "man-made" port. "In 1649 the port had a depth of six feet, but by dredging this has been increased to thirty-two feet, so that vessels of 12,000 tons can find accommodation." [1] Unlike Belfast, however, Dublin is not a great manufacturing centre, although it has many breweries and distilleries and some linen factories.

The central portion of the Irish Plain contains many lakes and bogs. Though the plain is composed of limestone, similar to that which makes up the northern Pennines (see p. 19), it is so low-lying that it is waterlogged. Rain and rivers have dissolved parts of the limestone, leaving hollows, some of which are still occupied by lakes. In many cases, however, the lakes have been filled up by peat formed by the masses of decayed vegetation. In this way were formed the peat-bogs which occupy a large part of the Central Plain. The chief of these, the **Bog of Allen,** has been partially reclaimed and now forms fertile farm land. The peat is cut and dried in summer and is then used for fuel.

The Irish Plain is drained by the Shannon, the longest river in the British Isles. For the greater part of its course the river flows very slowly over the almost level plain, and at several places spreads out to form large lakes. Near its mouth, however, the fall increases and the current becomes more rapid. This spoils the river for navigation, but has made it possible to use it for the generation of electricity. Part of the water has been diverted through a canal, at the end of which the water falls nearly a hundred feet to the turbines, which drive huge dynamos. The electricity generated is transmitted by overhead wires to all parts of the Irish Free State. This scheme is certain to be a great benefit to the country, as it will help to make up for the lack of coal.

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[1] L. B. Cundall, *Western Europe.*

On the southern side of the lower Shannon is the *Golden Vale*, one of the most fertile districts in Ireland. **Limerick,** the port at the mouth of the Shannon, is the chief centre for the distribution of the butter, bacon and eggs produced by the dairy farmers of the Golden Vale and neighbouring districts.

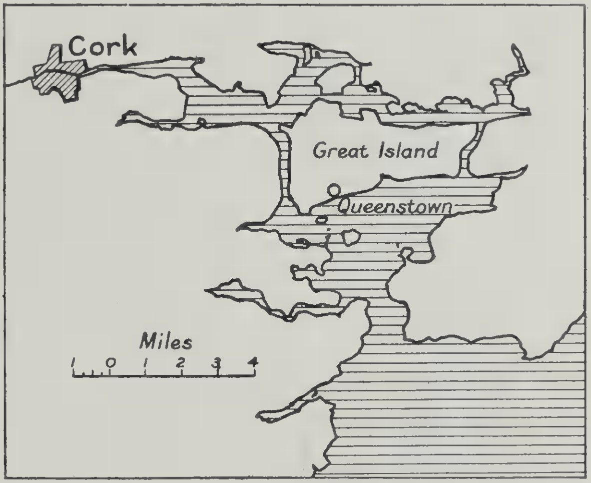
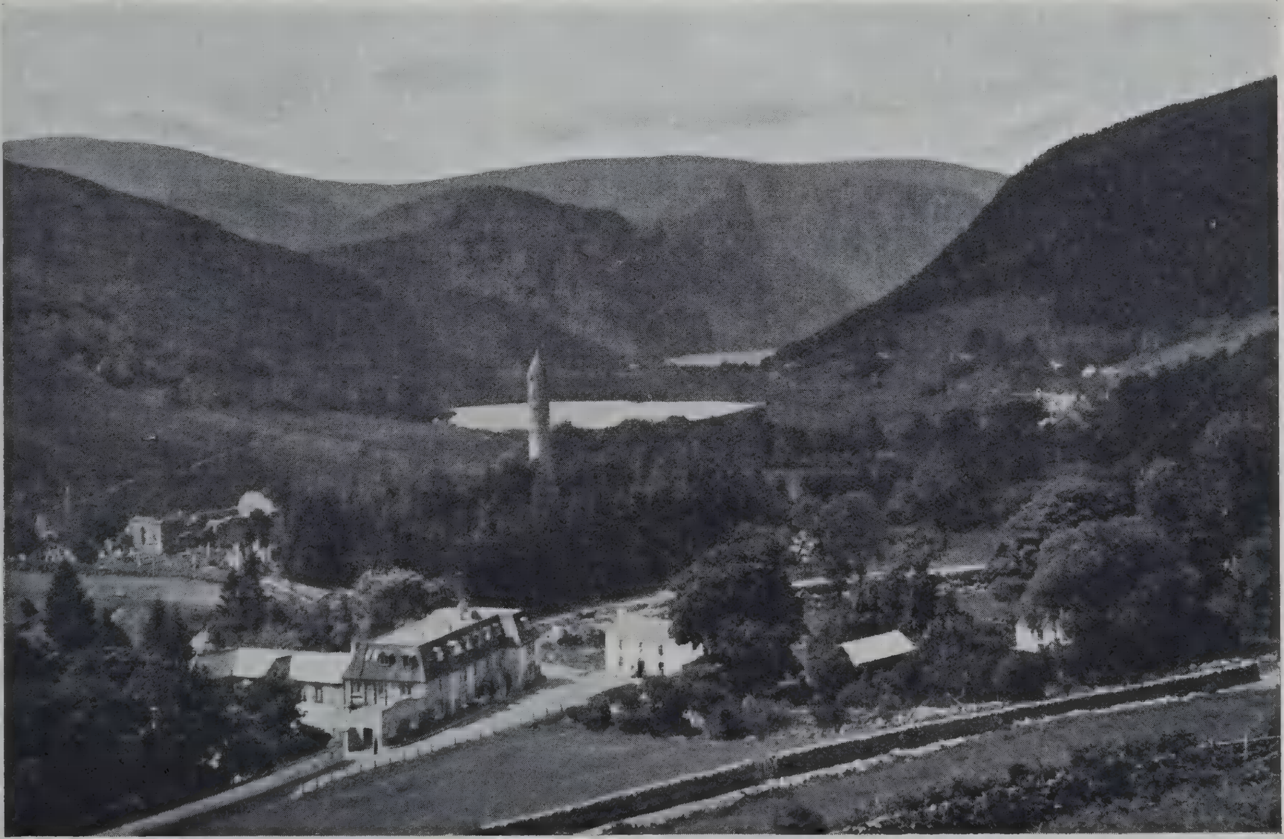


FIG. 102.—THE SITUATION OF CORK

South-Western Ireland is a land of heather-clad mountains and fertile green valleys. *The Lakes of Killarney*, perhaps the most beautiful in the British Isles, are visited every summer by thousands of tourists and holiday makers.

Cork, the chief city and port of southern Ireland, lies at the head of a deep and sheltered harbour. Its outport, **Queenstown,** is a port of call for transatlantic liners.

South-Eastern Ireland is not so mountainous as the south-west, and, as it has also the advantage of a rather drier climate, it is a more fertile farming district. The chief towns are **Waterford** and **Wexford,** each situated on an estuary at the highest point which can be reached by sea-



(*L.M.S. Rly.*)

FIG. 103.—SEVEN CHURCHES, GLENDALOUGH, WICKLOW

going vessels. **Rosslare,** the outport for Wexford, is the packet station to which fast passenger steamers ply from Fishguard in South Wales.

EXERCISES

1. Draw a diagram on squared paper to illustrate the following facts concerning the total annual value of the produce of farms in Northern Ireland :

Product.	Eggs and Poultry.	Milk and Butter.	Cattle.	Pork.	Sheep and Wool.	Other Products.	Total.
Value in £'s (millions)	3·0	3·0	2·0	1·6	0·6	3·6	13·8

(Draw a strip 6·9 ins. long to represent the total value, and divide this up according to the values of the individual products.)

2. Draw a sketch-map to show the chief routes from Great Britain to Ireland. Name the ports on each side.

3. The average density of population in Northern Ireland is 240 per square mile, whereas in the Irish Free State it is only 112 per square mile.

Give reasons for this difference.

4. Great Britain and Northern Ireland together have 45 times as much wheat-growing land as the Irish Free State, but only 4½ times as much land growing oats. Give reasons why the difference is so much greater in the case of wheat than in the case of oats.

SECTION II—MODES OF LIFE IN THE WORLD OF TO-DAY

CHAPTER XVI

HOW NATURE HELPS OR HINDERS MAN

Nature's greatest gifts are rain and sunshine; without them plants cannot grow, and without natural and cultivated vegetation man could not live. Nature has, however, distributed these gifts very irregularly over the surface of the earth. Some regions are too cold, and some too dry for vegetation to grow at all; other regions are so hot and wet that forest and jungle defeat man's efforts at cultivation; and even in those regions which have been most favoured by Nature man has to struggle hard to maintain a high standard of life.

REGIONS WHERE NATURE HINDERS MAN

(see fig. 104)

(1) **The Tundra.**—On the Arctic coastlands, or Tundras, of North America and Asia the winters are so long and dark and cold, that even though the weather is quite warm and sunny for a brief period in summer, the growing season is far too short for the cultivation of crops. The tribes who inhabit these regions spend all their energy in providing for themselves food, clothing, and shelter, and have never had the leisure or opportunity to develop a high degree of civilisation.

(2) **The Arid Deserts.**—In those parts of the earth where the Trade Winds blow over great stretches of land, or where

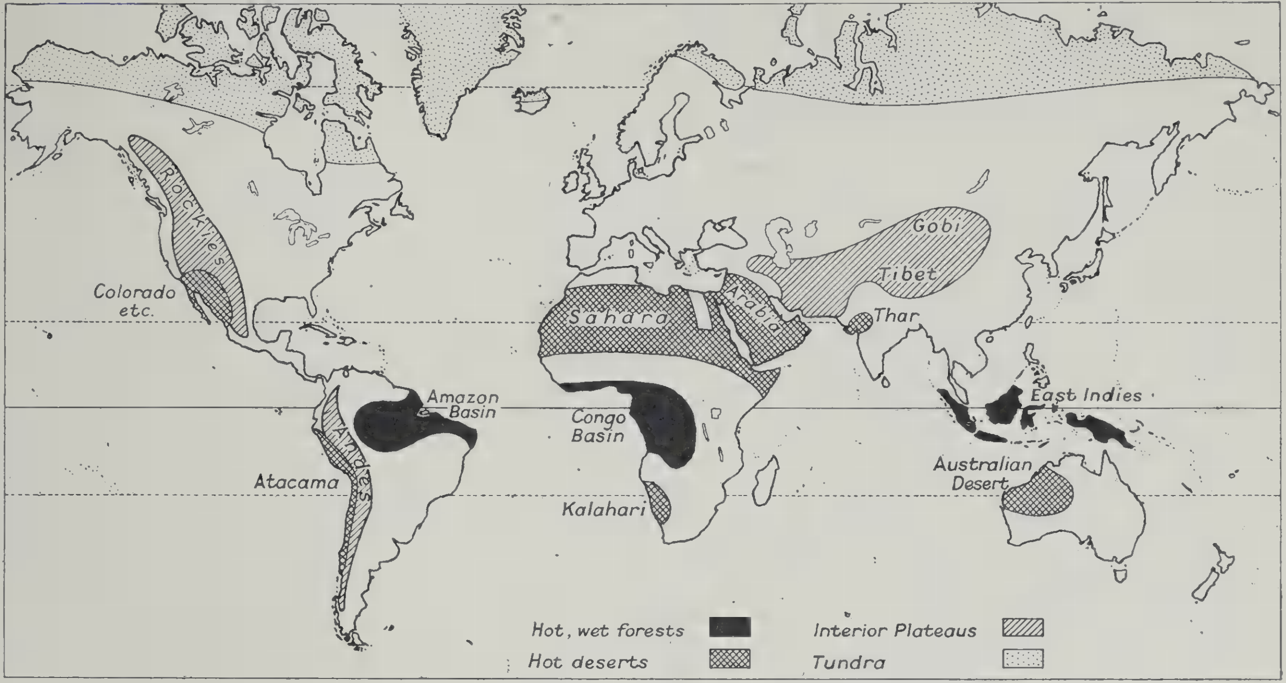


FIG. 104.—REGIONS WHERE NATURE HINDERS MAN

mountain ranges shut off all rain-bearing winds, there is so little moisture that hardly any plants will grow. These arid deserts may be divided into two classes, viz. :

(*a*) The *hot deserts*, such as the Sahara and the Kalahari in Africa, the Colorado desert in North America, Atacama in South America, and the Great Desert of Australia. These deserts are always hot because they are in the region where the sun is never very far from overhead at noon. They are dry because they are in the belt of the Trade Winds, which bring no rain since they blow over the land and from cooler to warmer regions.

(*High Commissioner for Canada*)

FIG. 105.—MAKING READY FOR THE 30-MILE DASH TO COPPERTOWN—THE LAST SLEDGE TRIP OF THE SEASON, BASIL BAY, CORONATION GULF

(*b*) The *interior plateaus and basins* such as the Tarim Basin and the Gobi Desert of Asia, which are so far from the sea and are so ringed round by mountain ranges that they receive hardly any rain. Like the first type of deserts they are very hot in summer, but in winter they are bitterly cold, partly because of the great elevation and partly because of the distance from the sea.

(3) **The Hot, Wet Forests.**—In the equatorial regions Nature has been too lavish with her gifts. Every day the sun climbs almost to the zenith, though on only two days a year, March 21 and September 22, is it directly overhead. As the air near the surface of the earth gets hot, it rises and cools, and the water vapour it contains is condensed and falls as rain. The combination of excessive heat and moisture causes the growth of dense forest and jungle, which make it very difficult, and in some places impossible, for man to cultivate the ground. So far as occupation by man is concerned, the equatorial forests may almost be classed as deserts ; if, indeed, we were lost in the African forest we should die of starvation almost as soon as we should in the Sahara.

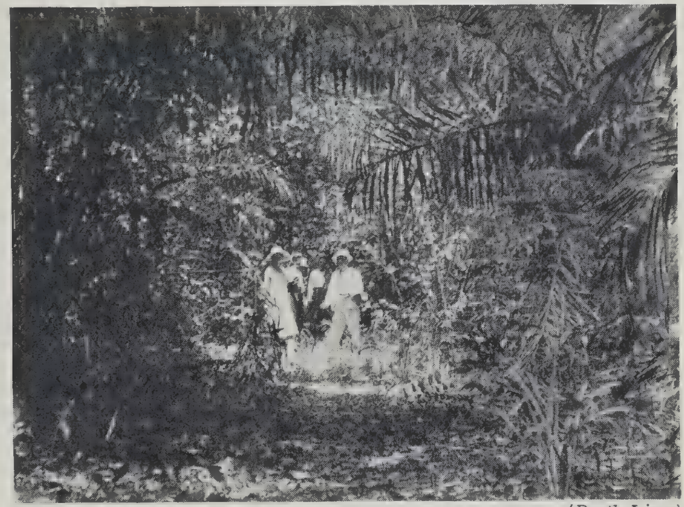

(*Booth Lines*)

FIG. 106.—IN THE EQUATORIAL FOREST

REGIONS WHERE NATURE HELPS MAN

Nature helps man most by encouraging him to help himself. Just as in school the pupil learns most when the

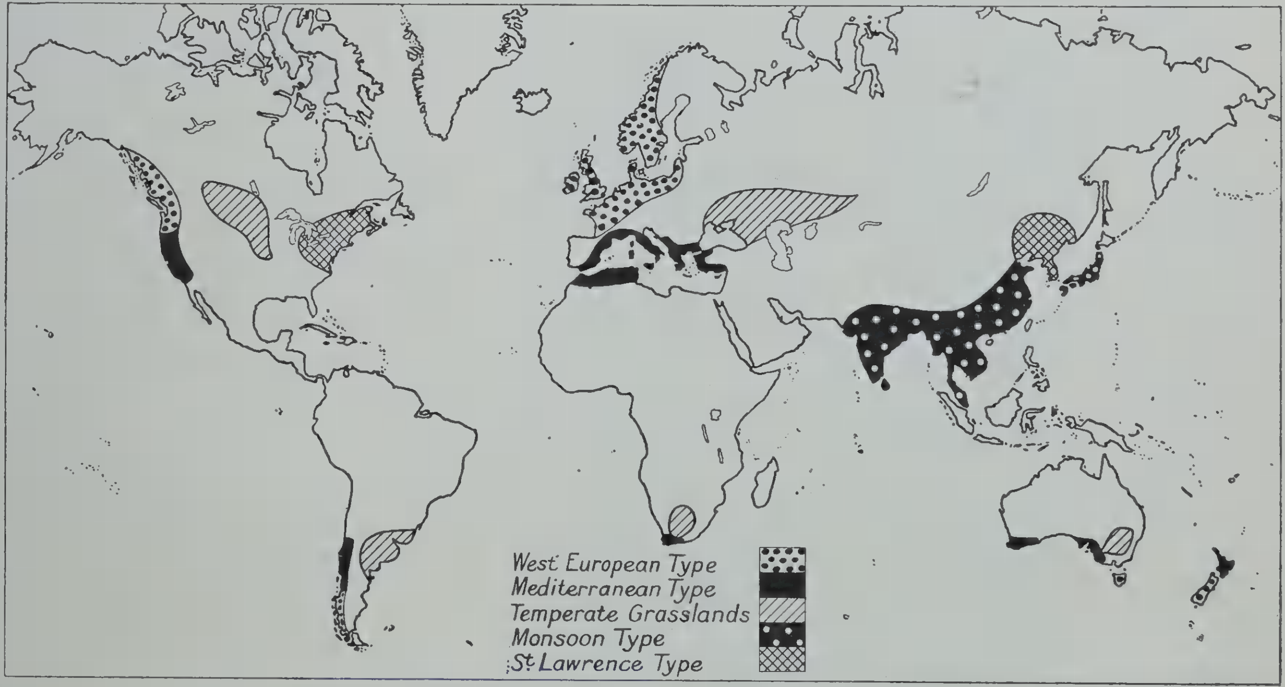


FIG. 107.—REGIONS WHERE NATURE HELPS MAN

work is neither so easy that he does not need to think, nor so hard that he loses heart, so man has progressed most where Nature has made things neither too easy, as in certain parts of the Tropics, nor hopelessly difficult, as in Arctic regions.

The natural regions where man has prospered most are:

(1) **North-Western Europe,** which includes the British Isles, owes its mild, moist, equable climate to the prevalence of westerly winds and depressions which sweep in from the Atlantic, and to the Gulf Stream which warms the prevailing winds.

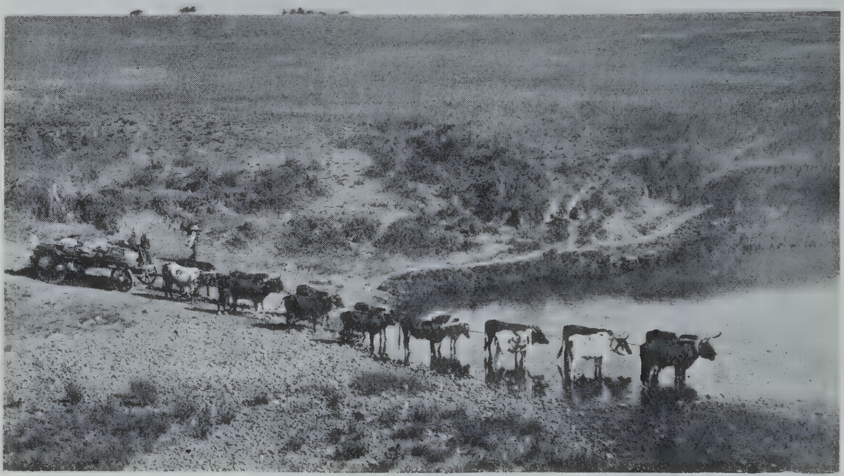
Other regions which have the same type of climate are British Columbia, southern Chile, Tasmania, and the South Island of New Zealand. All these, with the exception of Chile, are now parts of the British Empire and are inhabited almost exclusively by people of British descent.

(2) **The St. Lawrence Type.** Another region which has a climate somewhat like that of western Europe, although it is much colder in winter and rather hotter in summer, includes the north-eastern part of the United States and the St. Lawrence basin of Canada. This region rivals Europe in its prosperity, including as it does the largest cities, the chief ports and the busiest industrial centres of the United States and Canada. The only other region belonging to the same climatic type is Manchuria, now called Manchukuo by the Japanese, who took it from China in 1932 with the intention of developing its great resources.

(3) **The Mediterranean Region** was the home of the great civilisations of the ancient world—Phœnicia, Greece and Rome. One reason why civilisation developed earlier there than in north-western Europe is that the land was never densely forested since its climate does not favour the growth of trees. In winter, when it is subject to westerly winds and depressions from the Atlantic, it has warm, sunny weather with frequent showers. In summer, however, it has dry winds from the north-east, and the weather is then very hot and dry. The summer drought has always been a

great problem for Mediterranean farmers, but in very early times they learnt to irrigate the ground and also to grow crops which could withstand drought.

Other regions with a Mediterranean type of climate are California, Middle Chile, the Cape Town district, the south-western and south-eastern corners of Australia and the North Island of New Zealand. All are great fruit-growing districts, though Middle Chile has not yet developed a great export trade in fruit.



(South African Railways)

FIG. 108.—OX-WAGON ON THE VELDT

(4) **The Monsoon Region** of south-eastern Asia includes India, Indo-China, China and Japan. Monsoons are winds which blow from one direction in one half of the year and from the opposite direction in the other half. The summer monsoon brings much rain as it blows from the sea—from the south-west over India, and from the south-east over China and Japan. The winter monsoon brings little rain as it

blows from the land—from the north-east over India, and from the north-west over China and Japan.

By careful farming the peasants of the Monsoon lands can get two, or even three, crops a year from the same plot of ground. They are, nevertheless, desperately poor, since there are so many people that each family has to be content with a small plot of land.

Other regions with a climate somewhat like the tropical monsoon lands of Asia are Central America, the West Indies and parts of the eastern coastlands of South America, tropical Africa and Australia. South-eastern U.S.A., Uruguay, Natal and south-eastern Australia have warm, moist summers somewhat like those of northern China, though, unlike the latter region, they are also warm in winter.

(5) **The Temperate Grasslands,** viz., the *steppes* of Euro-Asia, the *prairies* of North America, the *pampas* of South America, the *veldt* of South Africa, and the *downs* of Australia, were once considered of little value. Now they provide the world with a very large part of its wheat, meat, wool and leather. The steppes and the prairies produce wheat ; the veldt, cattle and maize ; the pampas and the downs, wheat, beef, mutton and wool. Though they are not very densely peopled, since the farms are fairly large, the temperate grasslands are in normal times among the most prosperous parts in the world.

NORTHERN FORESTS AND TROPICAL GRASSLANDS

It would be easy to make a map of the world showing those parts which man has left in a state of nature and those parts which he has greatly altered. In the former class we should include those regions where Nature has hindered man—the Arctic regions, the deserts and the equatorial forests (see fig. 109). In the latter class we should include all those regions where man has prospered, for he has been able to do so only by changing the face of nature—by clearing the forests, draining the swamps, and replacing the natural vegetation by crops of his own choosing.

The Northern Forests and the Tropical Grasslands, though very different in most respects, are alike in this : in both regions Nature seems to have given with one hand and taken away with the other, and both have been allowed to remain largely uncultivated.

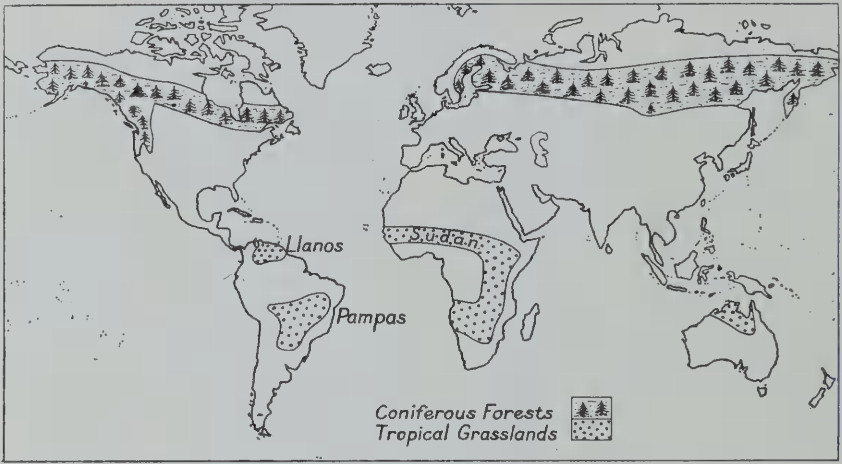


FIG. 109.—CONIFEROUS FORESTS AND TROPICAL GRASSLANDS

The **Northern Forests,** which occupy such a large part of northern Canada, northern Europe and Siberia, are the chief sources of the world's timber. The modern world would be hard put to it to find substitutes for the timber they provide for building purposes and for the pulp from which we make paper and artificial silk. But, in spite of their usefulness, the northern forests do not offer man a permanent home. The winters are so long and cold that crops cannot easily be grown ; so when man has cut down the trees, he leaves the land to Nature, who, by the slow process of growth, turns it into forest again.

In the **Tropical Grasslands,** or **Savannahs,** Nature has been generous in many things. She provides constant warmth and sunshine, and sufficient rain in summer for grass and cultivated crops, but not so much that forest trees thrive. At first sight it seems that the Savannah lands should be an ideal home for man. Unfortunately, the rainfall is very unevenly distributed. For six months or so in "winter" hardly a drop of rain falls, and even in summer there may be long periods of drought, succeeded by disastrous floods. The wild grass grows to a great height, but is of little use for grazing purposes ; the roots are so matted together that no plough will cut through them ; and the hot weather favours the spread of diseases which attack both men and beasts.

Up to the present, therefore, the savannahs have not proved of great value to man. In the Sudan, the natives cultivate scattered plots of ground and keep herds of scraggy cattle. In Rhodesia, Venezuela and Brazil some ranching is carried on, but most of the land is still undeveloped. The only tropical grassland which has been really conquered by man is that of northern Queensland, where the ranchers have the advantage of artesian wells which provide drinking water for the stock at all times.

EXERCISES

The tables on p. 154 give the average monthly temperature and rainfall of typical places in some of the Natural Regions of the N. Hemisphere mentioned in this chapter.

Draw graphs from each set of figures.

Say which of the above Natural Regions have :

(*a*) Much more rain in the summer half of the year (April to September inclusive) than in the winter half.

(*b*) Much more rain in the winter half than in the summer half.

(*c*) More than three months during which the average temperature is below freezing point.

TEMPERATURE (° F.).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Hot Wet Forest	73	74	73	72	72	71	70	71	71	71	72	73
Savannah	59	63	71	79	86	90	89	89	86	81	70	62
Hot Desert	49	53	61	70	77	87	93	91	84	72	58	50
Mediterranean	50	52	55	58	64	70	76	76	73	67	59	53
Temperate Grassland	−2	−1	14	38	51	62	66	63	54	41	24	7
Western Europe	41	42	43	47	52	58	60	60	56	50	45	42

RAINFALL (INCHES).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Hot Wet Forest	8	10	17	17	24	59	64	57	65	45	26	15
Savannah	0	0	0	1	2	4	6	10	5	1	0	0
Hot Desert	0	0	0	0	0·1	0	0·1	0·2	0	0	0	0
Mediterranean	4	3	3	2	1	0·6	0·3	0·6	1	4	4	4·5
Temperate Grassland	1	1	1	1·5	2	3	3	2	2	1	1	1
Western Europe	3	3	2	2	2	2	3	3	3	4	4	3

(*d*) More than three months during which the average temperature is above 70° F.

(*e*) Which have *equable* climates (*i.e.* a difference of less than 30° F. between the highest and lowest monthly temperatures).

(*f*) Which have *extreme* climates (*i.e.* a difference of more than 40° F. between the highest and lowest monthly temperatures).

CHAPTER XVII

PRIMITIVE PEOPLES

Though all the nations of the world differ to a greater or less degree in their customs and habits, we may easily divide them into a few groups according to the ways in which they win a livelihood.

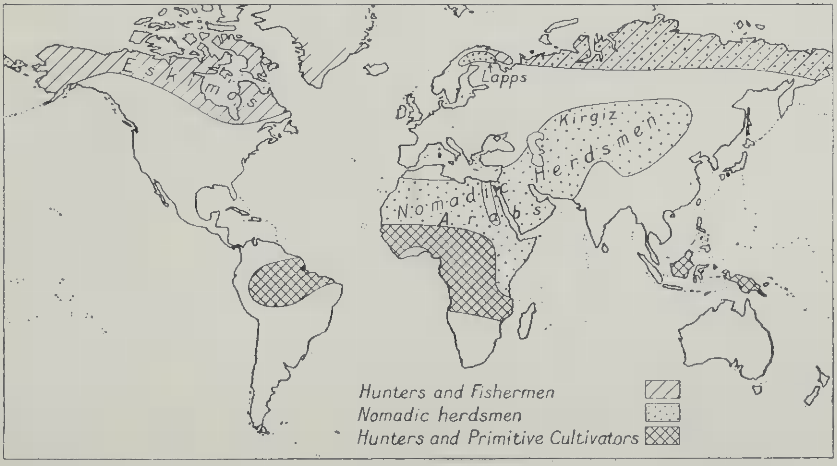
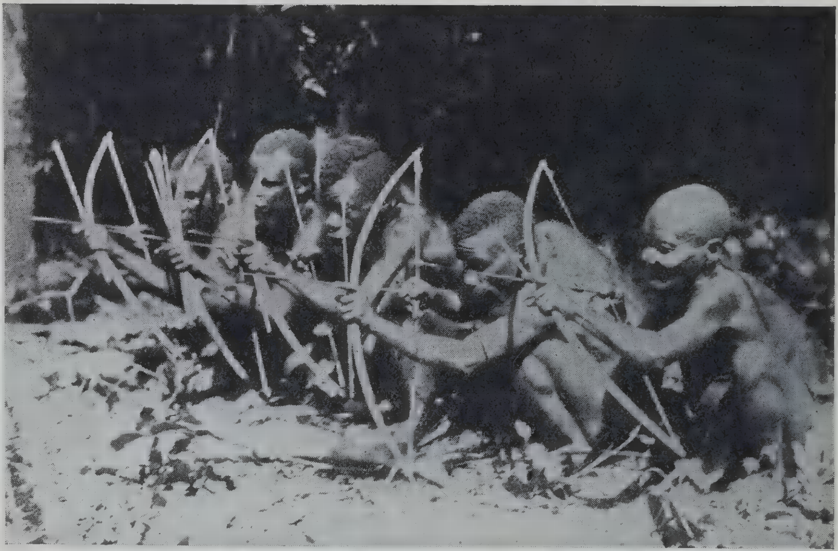


Fig. 110.—AREAS INHABITED BY PRIMITIVE PEOPLES

I. **HUNTERS, FISHERS and COLLECTORS** stand at the bottom of the scale. They depend almost entirely on what Nature provides for them in the way of game, fish and vegetable foods. They do not cultivate the ground or keep domestic animals for food. They have frequently to move about from place to place in search of fresh supplies of food and, having little settled home-life, they remain low in the scale of civilisation.

Two representatives of this class, who live in very different types of regions, are the Pigmies and the Eskimos. **The Pigmies,** so called because of their small stature, live in the hot, wet, equatorial forests of Africa, Malaya and the East Indies. They live mainly by hunting wild animals, some tribes using blowpipes and others bows and arrows. They are exceedingly skilful in tracking down wild animals, but as these are scarce in the dense forests they depend largely on the berries, leaves, roots and grubs which the women and children collect. At their temporary encampments they erect rough shelters of sticks or branches stuck in the ground and covered with leaves.

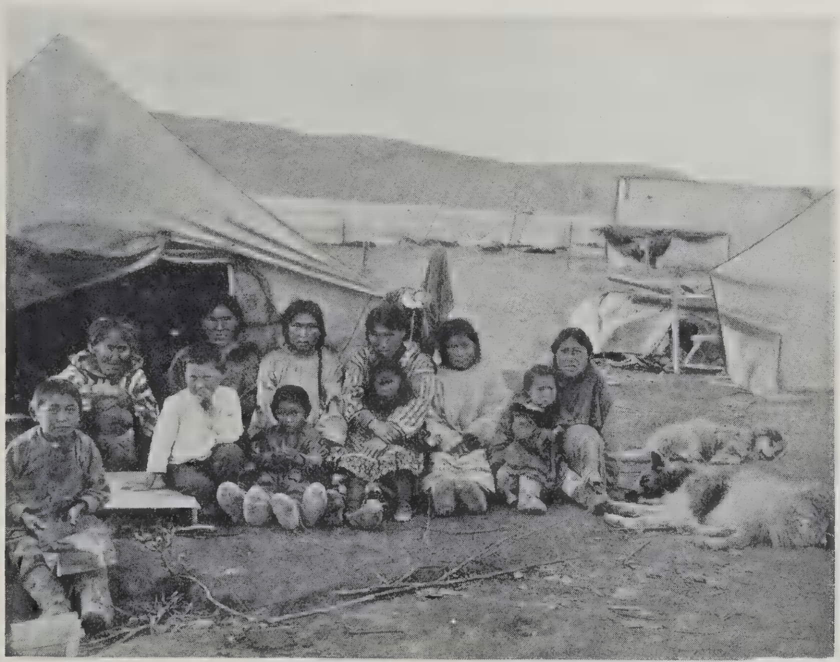


(*Topical*)

FIG. 111.—AFRICAN PIGMIES

The Eskimos, who live on the Arctic coastlands of North

America, adapt their mode of life to the changing seasons. In summer they live in tents made of deerskin supported on poles, and the men spend much of their time in hunting the cariboo, or wild reindeer, and in fishing in the ice-free waters of the lakes and the sea. In winter they erect frost-proof houses of snow, or of earth piled over a framework of drift-wood or whalebone.



(*Topical*)

FIG. 112.—A GROUP OF ESKIMOS OUTSIDE THEIR CANVAS TENT

Unlike the pigmies, who can seldom be persuaded to abandon their primitive existence, many of the Eskimos have changed their way of life since coming in contact with the white men. Many of them now spend much of their time in hunting and trapping the silver fox and other animals, whose furs they sell to the white traders. With the money they get they buy canned foods, woollen clothing, timber with which to build wooden houses and stoves to heat them. It is to be feared, however, that the change from the primitive mode of life is not good for the Eskimos, for it seems to render them more susceptible to disease.

II. **NOMADIC HERDSMEN** depend almost entirely on their flocks and herds, which they drive from place to place in search of pasture. We may take as examples three groups of people living in very different natural regions.

The Bedouin Arabs dwell in the Sahara and Arabian Deserts, driving their flocks of sheep and goats and herds of camels from well to well, and from one poor pasture to another. It must not be thought, however, that the Arab wanders aimlessly over the desert, trusting to the lucky chance of finding pasture. " He is familiar with all the water-holes, springs and wells, and has special places to which he regularly migrates provided there is grass. Sometimes, to be sure, if the rain is especially abundant and the grass grows thick and green, as occurs at long intervals, he does not need to camp beside a source of drinking water. The animals eat so much green grass that they can get along without water and the people make milk serve for both food and drink. As for washing it is enough for the Arab to rub his hands in the sand." [1]

The dwellings of the Arabs are tents which consist simply of large pieces of goat- or camel-hair cloth, supported by several poles. Their only furniture is such as can easily be packed on the back of a camel—rugs, leather bottles, a few metal cooking pots and perhaps a primitive spinning wheel.

The Kirghiz live on the poor grasslands and barren mountains of central Asia. The people of the grasslands keep large flocks of sheep and herds of cattle and sometimes camels, but the animal they prize most is the horse. The dwellers in the mountains depend chiefly on the yak, a large kind of ox which feeds on the poor grass and moss growing on the barren mountain sides. It is used as a beast of burden, its milk forms the chief food of the Kirghiz, and its long hair is made into clothing. The tents or "yurts" of the Kirghiz consist of a lattice framework upon which felt and skins are placed. In winter the tribes usually select some sheltered spot where there is water and good pasture and there make a semi-permanent camp, but in summer they are almost constantly on the move from one poor pasture to another.

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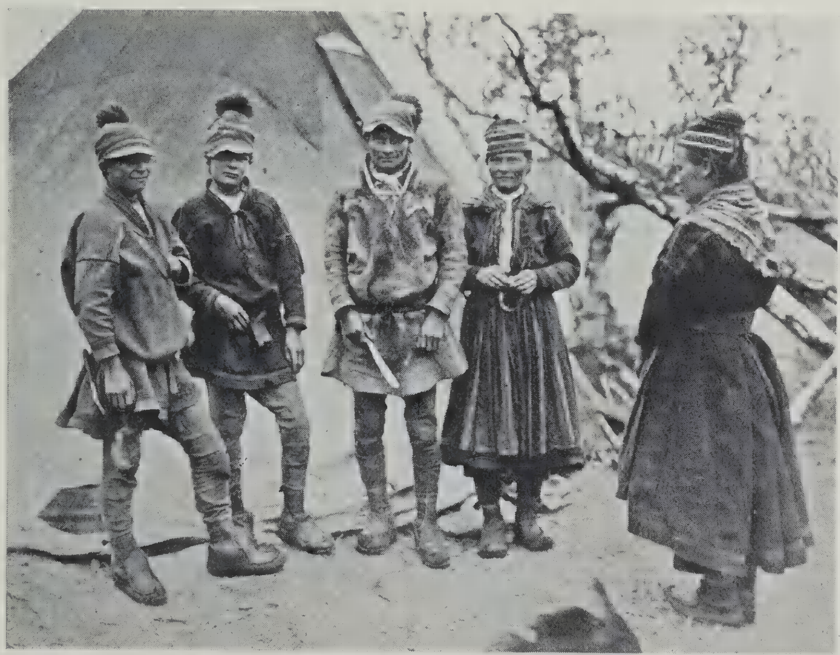
[1] Huntingdon and Cushing, *Human Geography*.



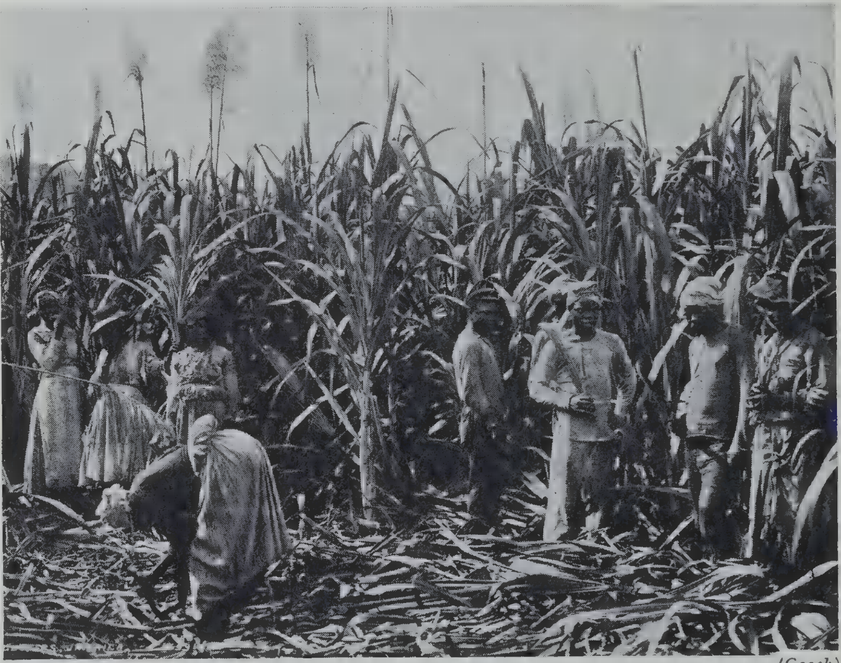
(*Keystone View Co.*)

FIG. 113.—LAPLANDERS

The Lapps, who live in the Arctic regions of Scandinavia and Finland, are divided into two groups—Fisher Lapps and Nomad Lapps. The former live chiefly by fishing, though many have recently taken up dairy farming in addition.

The Nomad Lapps depend almost entirely on reindeer, which provide them with milk, meat, clothing and means of transport. In summer the people live in tents of reindeer skin, and the animals are driven to the snow-covered uplands, where they graze on the arctic moss which forms their chief food. In winter huts of branches covered with turf are built in the valleys, where the herds can find shelter from the icy blasts.

Like the Eskimos, the Lapps are gradually adopting some of the conveniences of civilisation, though the nomadic tribes still cling to their wandering mode of life.



(Gooch)

FIG. 114.—CUTTING SUGAR CANE IN JAMAICA

(Note the *machete* on the man's shoulder)

III. **PRIMITIVE CULTIVATORS.**—The simplest type of farming is carried on in the equatorial regions, where the natives clear the undergrowth by burning it during the short dry season. Then they make holes in the ground with pointed sticks, drop a few seeds in each, and, with the exception of occasional weeding, leave the rest to Nature and to chance. Usually such primitive "farming" is left to the women, while the men occupy their time in hunting. As the plantations soon get choked with weeds, fresh ones have to be made almost yearly, and as the game in the near-by forest soon becomes scarce, the tribes frequently move from place to place. They are, therefore, said to be semi-nomadic in their mode of life.

In the less densely forested areas, and in the savannah lands, the natives live in permanent villages and depend chiefly on agriculture. Even here, however, fresh farms have to be cleared from time to time, as the soil soon gets exhausted of plant food. The chief food-crops grown in the hot, wet forest regions are manioc, yams, bananas, sugar-cane, rice, beans and pumpkins. Almost the only agricultural implement used by the millions of negro farmers of tropical Africa is the *hoe*, while in Central America and the West Indies the huge knife known as the *machete* is used for almost every agricultural purpose.

EXERCISES

1. Divide a double page of your exercise book into four columns headed: Pigmies, Eskimos, Arabs, and Lapps respectively.

In these columns write short notes about each of the following: the dwellings, the dress, the food, the domestic animals, the work of the people.

2. Copy from some travel book or story book a description of the scenery in the homeland of one of the peoples mentioned in this chapter. Be prepared to read your account in class.

3. If you know of any adventure stories dealing with any of the peoples mentioned in this chapter, help to form a class list of such books.

CHAPTER XVIII

SKILFUL FARMERS

Even the primitive peoples of the world, such as those mentioned in the previous chapter, are very skilful in certain ways, as we should realise if we had to try to make a living in the Sahara Desert, in the African forest, on the barren steppes of Asia, or on the frozen lands of the Arctic. But their skill is small in comparison with that of the farmers of the more densely peopled parts of the earth, who have learnt to produce large crops from small areas of ground.

(1) **The Rice Farmers** of south-eastern Asia are among the most skilful farmers in the world. In the rainy parts of India, China and Japan a farm the size of a football pitch (2 to 3 acres) is made to produce sufficient food for a family.

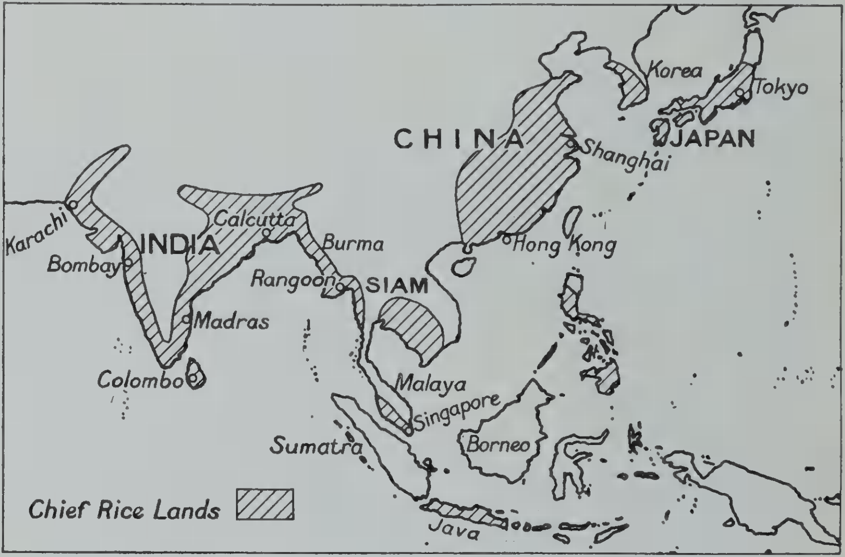
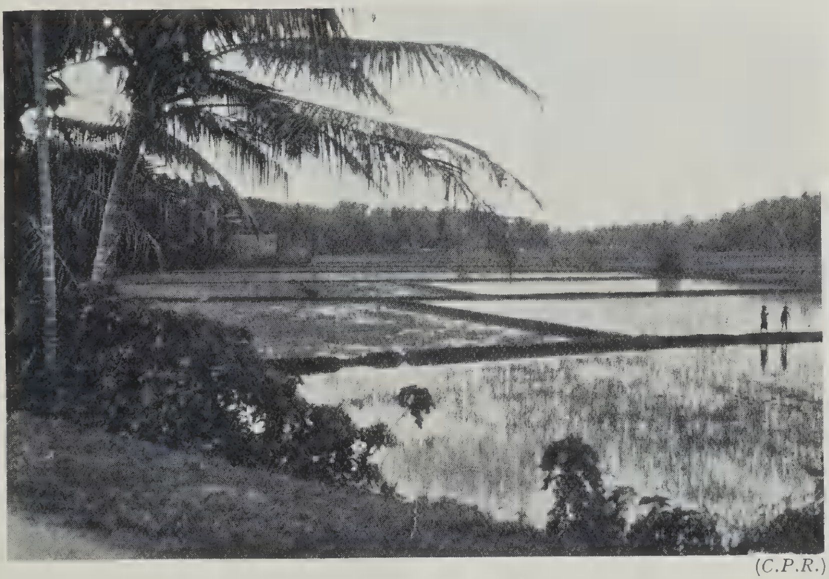


FIG. 115.—THE RICE LANDS OF SOUTH-EASTERN ASIA

To prepare the ground for their chief crop, rice, they first allow water to run on to the land to soften it, then plough it two or three times in different directions. The fields are then flooded to a depth of a foot or so and young rice plants, which have been grown in a "nursery bed," are transplanted in rows. A gentle stream of water is kept running through the fields until the rice is nearly ripe.

With care and skill a crop of rice may be reaped in four months from sowing. This makes it possible to grow one or even two other crops on the same ground in the course of a year. It might be expected that such "intensive farming" would exhaust the soil, but as a matter of fact there are large areas in China which have been producing two or three crops every year for forty centuries or more and yet remain as fertile as ever.



(C.P.R.)

FIG. 116.—PADDY FIELDS

One reason for this is that the farmers know how to renew the soil by the system of rotation of crops ; another reason is that the river water used to irrigate the rice fields brings with it mud which fertilises the land.

In addition to food-crops most of the farmers of the rice lands produce some crop for sale. In China and Japan the chief of these "money crops," as they are called, are tea and silk ; in India, cotton and various seeds from which oil is obtained are cultivated for the world markets as well as for local use.

(2) **Plantation Workers.**—Though there are many tropical

plantations which are owned and worked by the natives themselves, the most productive are owned and managed by white men, who employ native labourers to do the manual work. It is from such plantations that we draw the bulk of our supplies of tea, coconuts, rubber, palm oil, bananas and other tropical products.

In order to learn how tropical plantations are worked, let us imagine that we are making a coconut plantation in, say, the Malay States. We shall first buy a tract of jungle near to the sea, or a navigable river, or a railway, so that in the years to come we shall be able to market our produce cheaply. Then we shall hire native contractors to fell the trees, cut down the undergrowth and root out the stumps. This work will be done in the dry season, and all the debris will be burnt before the rains set in. Meanwhile we shall have planted seed-coconuts in a carefully prepared nursery bed, and when the young plants are ready they will be transferred to the permanent plantation, and set in pits 2 ft. square and 2 ft. deep.

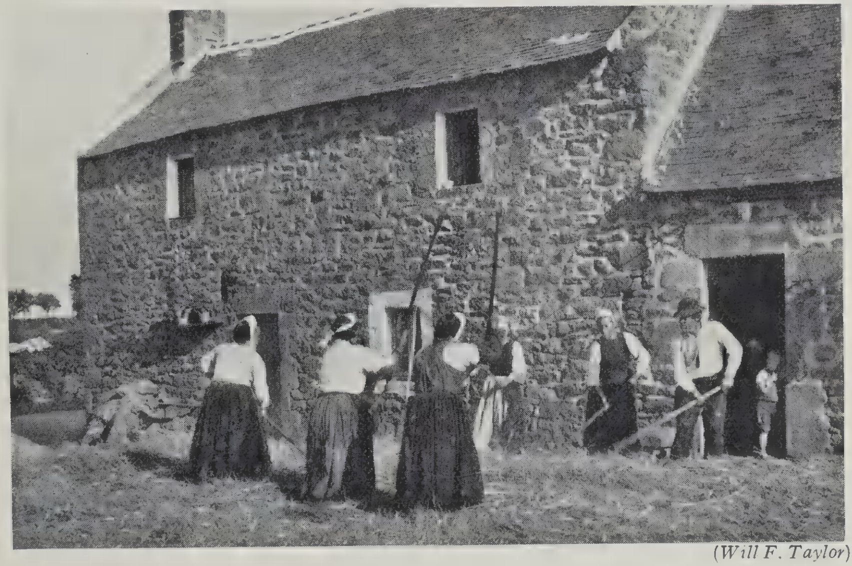
For five years our plantation will yield nothing, though all the time we should have to employ native labourers to manure and drain the ground and keep it clear of weeds. In the sixth year we may expect to get about 10 nuts from each tree, and from the ninth year onwards we shall get 50 to 80 nuts per tree. Picking is, of course, done by hired natives, who cut notches in the trunks so that they can be easily climbed. A good worker will pick from 400 to 500 nuts in a day, though in the West Indies, where the pickers climb by means of a rope loop which passes round the tree and the body, one man can pick 1,000 nuts in a day.

After picking, the nuts are husked and the flesh spread out to dry to form copra, which is sold to the merchants.

(3) **European Peasant Farmers.**—Though the climate and soil of Europe are not so favourable to intensive cultivation as the most fertile parts of the Tropics, the peasants of many European countries are among the most successful

farmers in the world. Farming varies a great deal not only from country to country, but also in different parts of the same country. We may, however, take the peasants of central Italy and those of France as typical of the farmers in two different climatic divisions of Europe.

In central Italy the chief difficulty of the farmer is that, although the winters are sufficiently warm and moist to ripen crops, the summers are so hot and rainless that the ground is parched. The Italian peasant, however, has learnt how to grow crops throughout the year, so that every season brings its harvest. Beans and vegetables are grown in winter ; wheat is sown towards the end of the winter rains and ripens during the heat of summer ; grapes, which require moisture in spring, and hot, dry weather for ripening, are harvested in autumn ; and olives, which grow best on the dry, stony soils of the hillside, are ready for gathering in the winter. The Italian peasants are, therefore, kept busy throughout the year ; but although they work very hard



(*Will F. Taylor*)

FIG. 117.—FRENCH PEASANTS AT WORK

and very skilfully, most of them are very poor. This is chiefly because the farms are so small that nearly all the land is needed to produce food for the family, and little can be spared to produce crops for sale. So poor, indeed, are many of the peasants that they cannot find money to purchase seeds, manures and agricultural implements, and in many districts these are provided by the landowner, who receives in return a share of the products.

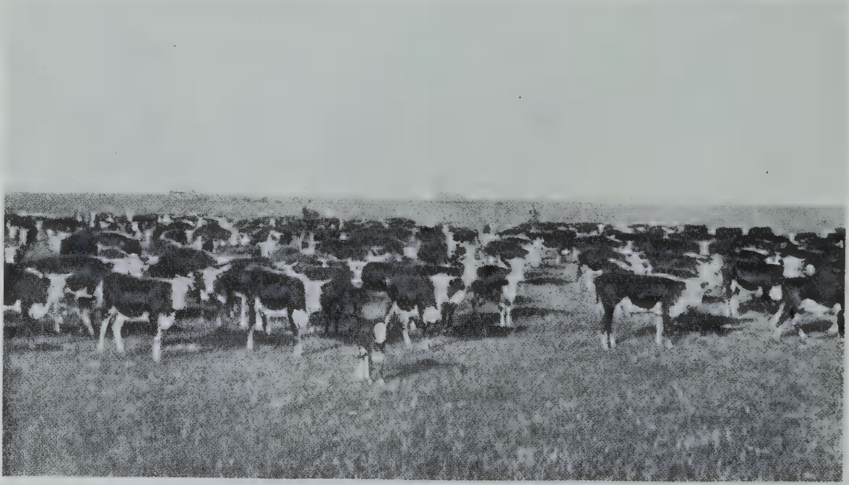


FIG. 118—ROUND-UP OF CATTLE ON THE PAMPAS

France, although it is one of the great manufacturing and trading nations of the world, is also a land of peasant farmers. Most of the farms are quite small, and they are generally owned by the peasants themselves, who have an intense love of the soil. A curious feature of the French farms is that each consists of many scattered plots of land which are often widely separated, so that a man may have to walk a mile from his wheat field to his meadow, another half-mile to his potato patch, and so on.

Because of this arrangement, which is due to the fact that when a man dies his property must be divided equally among his children, the French peasant not only wastes a good deal of time in going from one field to another, but also finds it difficult to introduce modern agricultural machinery.

(4) **Commercial Farmers.**—In most highly civilised countries the farmers produce very little for their own personal use. They do not grow much of the food they eat, or spin their own wool, or make their own leather; instead they specialise in the production of "money crops" such as wheat, wool, meat, fruit, dairy produce, etc.

Their farms are like factories which turn out goods for the world's markets, and the farmers depend on the money they receive for their produce almost as much as factory workers depend on the wages they earn. There are some countries, indeed, whose people depend on the exports of farm produce just as much as we in England depend on our exports of manufactured goods. Thus Denmark depends on the export of dairy produce, Australia on wheat and wool, New Zealand on dairy produce, mutton and wool.

Countries such as these are great trading countries, for nearly everything they produce is exported, and nearly everything they eat, wear or use is imported. New Zealand, for example, has, *in proportion to her population*, more foreign trade than any other country. In 1929 the value of her imports and exports was £66 per head of the population, while in Britain it was £40, and in Italy, where the people produce most of their own food, only £9 per head.

(5) **Communist Farmers.**—Before the Bolshevik Revolution of 1917, the vast majority of the Russian people were peasants, who cultivated small scattered plots of land in a most primitive and inefficient manner. The Soviet Government decided, however, to apply the principles of communism to farming. In most districts the peasants were persuaded or compelled to pool their land, stock and implements, so as to form large collective farms.

On such farms the former peasants work in groups under the direction of a manager; tractors and modern agricultural machinery are used; crops are grown in proper rotation and great efforts are made by the Government to increase the yield of produce. After the harvest, a certain proportion of the crops has to be sold to the Government, the remainder being divided among the workers in agreed proportions.

In other districts the Government has set up huge State farms, one of which, known as the *Giant*, is as large as Oxfordshire. These vast farms are run on the same lines as factories and are, indeed, sometimes called " grain factories." Ploughing, sowing and reaping are done by the aid of fleets of oil-driven tractors, the workers are organised in brigades and housed in communal villages.

The greatest difficulty the organisers of such large-scale communistic farming have to face is that the peasants know little about the machines they have to use, and so frequent breakages hold up the work. The Soviet Government expects, however, that as the people become more skilled the production of wheat and other crops will be greatly increased.

EXERCISES

1. Try to make a list of the jobs a farmer does in each month of the year.

While you are making your list, ask yourself whether farming is " skilled " or " unskilled " work.

2. Keep newspaper cuttings which record the success or failure of the Russian methods of farming.

3. The following table shows the exports of copra from some of the chief producing countries in 1931 (thousand tons) :

Dutch E. Indies.	British Malaya.	Ceylon.	New Guinea.
350	190	90	62

Trace a map showing these areas, and near each draw a coconut roughly proportional in height to the amount of copra exported.

CHAPTER XIX

INDUSTRIES WHICH ROB NATURE

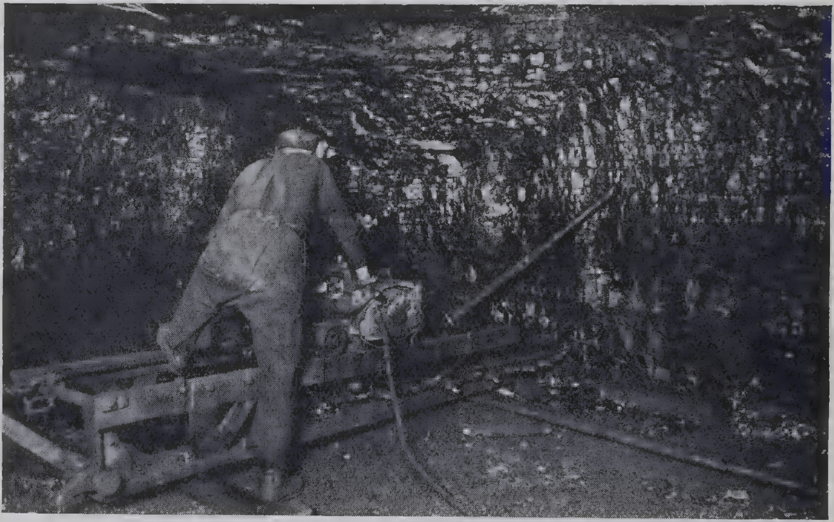
We have learnt that people in the lowest stages of civilisation do not till the ground or rear animals for food, but depend entirely on what Nature provides. They kill animals and collect vegetable foods, but never help Nature to produce anything, and though their "harvest" is usually a poor one, may be said to reap where they have not sown. The same is true of many classes of workers in highly civilised countries. Fishermen, miners, lumbermen, and trappers of fur-bearing animals all rob Nature of supplies which they cannot or do not replace.

THE MINING INDUSTRY

Minerals are of the very highest importance to the civilised world, for without coal, oil, iron, copper and other metals we should not have advanced beyond the most primitive stages of civilisation.

Coal is, of course, the chief source of power, and the chief coal-mining countries of the world are also the chief manufacturing countries. The United States of America heads the list with about one-third of the total world production; Britain comes next with a fifth of the world's total; then follow Germany, Russia, France, Poland and Belgium. Outside Europe and North America the only great coal-producing countries are Japan and India. There are, however, vast supplies of coal in China, which may in the future enable that country to develop great industries.

Coal was formed ages ago from decaying vegetation which was buried under a great thickness of sand and mud. The process must have taken an incredibly long period, and it is hardly likely that any more will be formed during the life of man on the earth. It seems, then, in the course of time we shall have completely exhausted the supplies of this valuable mineral. There is, however, no need for alarm, as the supplies of coal in Britain will last, at the present rate of production, for about 700 years, by which time our scientists may have discovered other sources of power. Still, many people claim that we are squandering the gift of Nature by using our coal uneconomically. It certainly is true that when we burn coal we lose a large part of its heating power, and attempts are now being made in this and other countries to find methods of using the coal more efficiently.

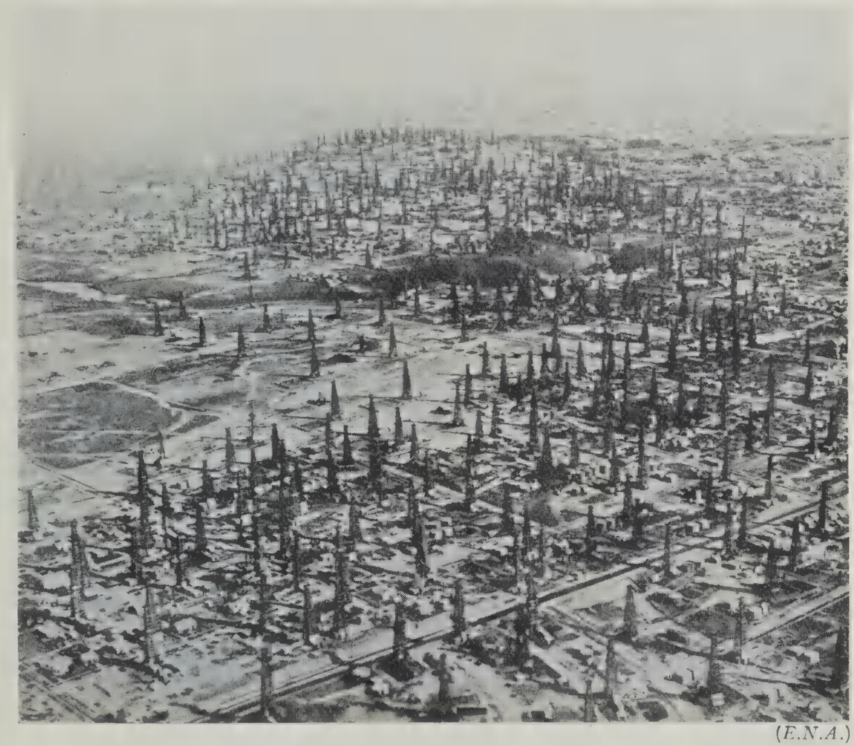


(E.N.A.)

FIG. 119.—CUTTING COAL BY MACHINERY IN THE U.S.A.

Mineral oil, or petroleum, is now a great rival to coal as a source of power. Not only is it the source of the petrol used to drive motor cars, etc., but the crude oil is used for driving steamships and certain kinds of locomotives and motors. Petroleum is also a very important raw material, yielding such products as paraffin, lubricating oil, vaseline and wax.

Petroleum is obtained not by mining, but by boring. When the underground reservoir is tapped the oil sometimes rises up the bore-hole and spouts out at the surface. Such wells are known as "gushers," and are often difficult to control. In most cases, however, the oil has to be pumped to the surface. No one can foretell how long a particular oilfield will last, but it is certain that unless new supplies are discovered, the world's supply of oil will rapidly be exhausted.



(*E.N.A.*)

FIG. 120.—A CALIFORNIAN OIL-FIELD

In the production of oil the United States stands far ahead of other countries, for she supplies about 60 per cent. of the world's total, while Russia, the next important producer, supplies only 12 per cent. Venezuela supplies 9 per cent., while Rumania, Persia, Mexico and the Dutch East Indies share the remainder. Britain, of course, produces no petroleum, and it is therefore particularly unfortunate that there are no large supplies in any of our colonies or dependencies. In spite of this British companies control a large portion of the world's output and are great rivals of the American companies.

Iron is almost as necessary to our civilisation as coal. It does not occur pure in nature, but in the form of ore, *i.e.* compounds of iron, mixed with many impurities. In order to produce iron the ore has to be mixed with limestone and either coal, or coke, or charcoal. There are three forms in which iron is used : *cast iron* contains several impurities and is brittle ; *wrought iron* is very pure and can be hammered or rolled into any desired shape ; *steel* is pure iron to which a certain quantity of carbon has been added. Special types of steel are made by adding small quantities of other metals such as manganese, nickel and chromium.

In the production of iron and steel the United States is again the leading country, with more than one-third of the total world production. France is second on the list with 15 per cent. of the world's total, then follow Germany, Russia, Britain and Belgium, in order of their total production.

Other metals, including tin, copper, lead, zinc, etc., are vitally important to the civilised world. It would be tedious to describe the production of these, but it is interesting to note that the United States is the leading producer of all those named with the exception of tin, which is mined chiefly in Malaya, Bolivia and the Dutch East Indies.

LUMBERING

In nothing has man been so wasteful as in the way he has used the forests. Over thousands of square miles the trees have been ruthlessly burnt or felled and left to rot. Even where timber is cut for sale, the lumbermen have often cut down far too many trees, caring for nothing except making quick profits. Fortunately, men have realised that unless we take great care the world will soon be short of timber, and nowadays in many timber-producing countries, such as Norway and Sweden, men are not allowed to cut more timber in a year than will be replaced by natural growth. Great precautions are also taken to prevent damage by fire. In Canada, where it has been estimated that up to recently more timber was burnt each year than was cut by the lumbermen, hundreds of observation towers, equipped with telephone and wireless, have been set up at intervals through the forests. In addition, the forests are regularly patrolled by light aeroplanes, whose pilots wireless news of any fires to the base camps, where large planes equipped with fire-fighting apparatus are kept in readiness.

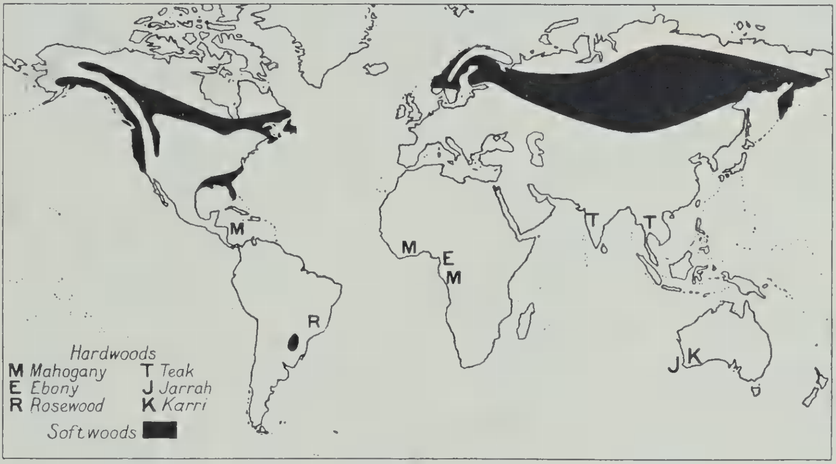
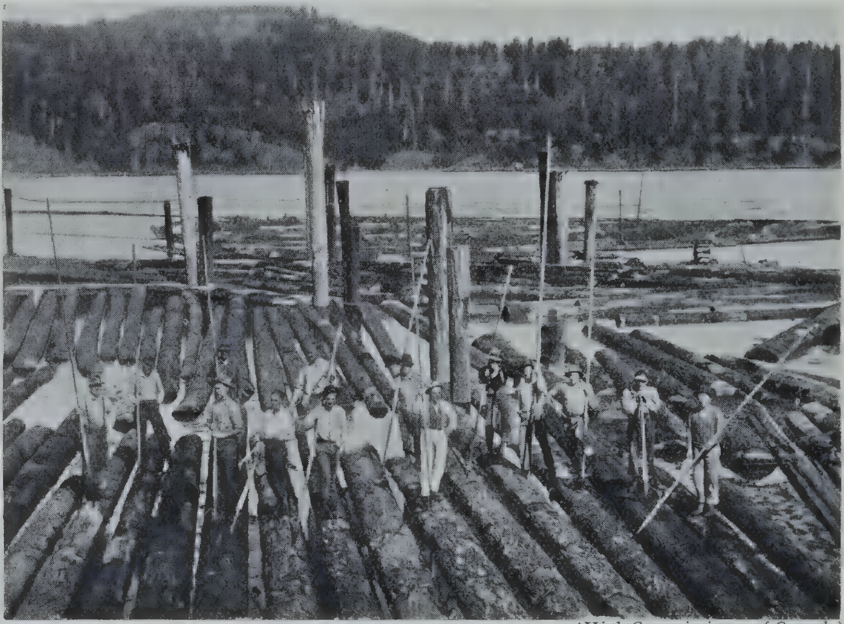


FIG. 121.—THE WORLD. SOURCES OF TIMBER

Most of the timber used in the world is obtained from the coniferous forests of North America and northern Europe. The trees are felled in winter, when most of the forest-lands are frostbound. The logs are dragged over snow-ways and piled on the frozen rivers, down which they float when the ice melts in spring.

British supplies of timber are obtained chiefly from Sweden, Norway, Canada and western United States.

In addition to the coniferous soft-woods, which are used chiefly for building purposes, we import hard woods for furniture making. Many of these, such as oak, maple and walnut, grow in temperate regions, while others, such as mahogany and rosewood, come from the tropical forests. Lumbering in these latter regions is a very difficult business. In the northern forests thousands of trees of the same kind grow close together, but in the equatorial forests men have to " hunt " for particular trees—indeed, the men who cut mahogany in the forests of British Honduras are called " mahogany hunters."

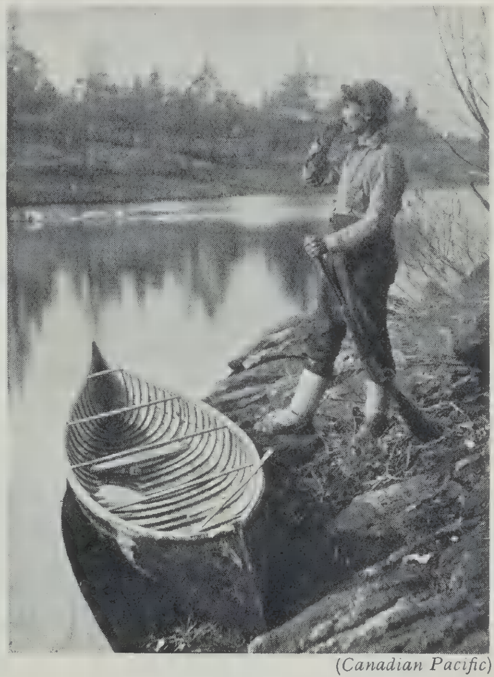


(High Commissioner of Canada)

FIG. 122.—MAKING-UP THE BOOMS OF LOGS IN BRITISH COLUMBIA

HUNTING AND TRAPPING

Most of the fur-bearing animals of the world live in the coniferous forests, especially on the northern fringe, where the forest is less dense. In **Canada** the industry is chiefly carried on by Indians and half-breeds. Each man has his own special hunting ground, where he spends the winter, setting traps at intervals over a forty or fifty mile round. In spring he goes to the trading station—probably a Hudson's Bay post—to sell his furs and buy a fresh stock of powder, shot, blankets, flour and so on. The chief fur-bearing animals of Canada in order of the total value of the furs produced are: musk-rat, beaver, white fox, silver fox and mink.



(*Canadian Pacific*)

FIG. 123.—CALLING MOOSE

Siberia, another important source of fur, supplies chiefly sable, ermine and squirrel.

FISHING

It is a remarkable fact that the cold seas of the polar regions contain more of the small organisms on which fish feed than the warmer waters of the tropics. As a consequence of this, most of the important fishing areas of the world are situated in the shallow seas of temperate regions, to which tides and currents bring cold water from the polar seas. The shallow seas of the Continental Shelf of north-western Europe are the most important fishing ground in the world.

Several countries share with Britain in the harvest of these seas. *Norway* is, in proportion to her population, the foremost fishing country in the world. The chief fish caught are cod, herring and brisling (for "sardines"). Cod-fishing is carried on chiefly off the northern coasts, the season lasting from January to June. Nearly the whole of the catch—some 60 million fish in an average season—is either salted or dried for export to Mediterranean and tropical countries. Herring and brisling are caught chiefly off the coasts of southern Norway. Other countries of north-western Europe which have large fishing fleets are Sweden, Denmark, France and Portugal.

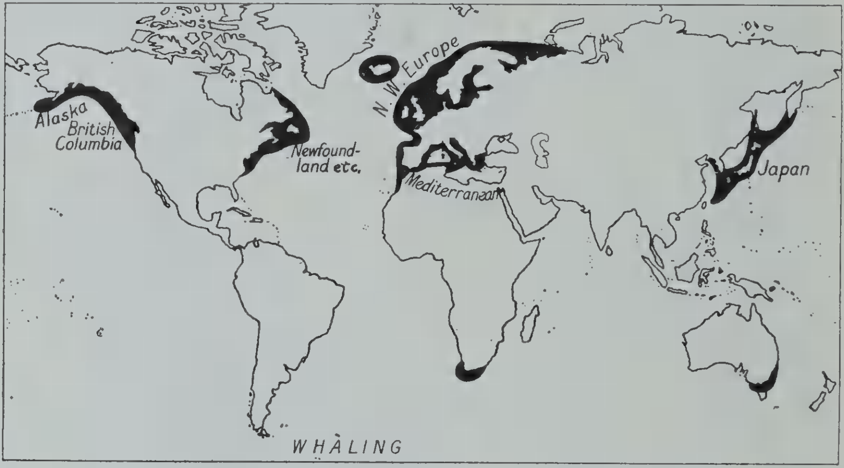
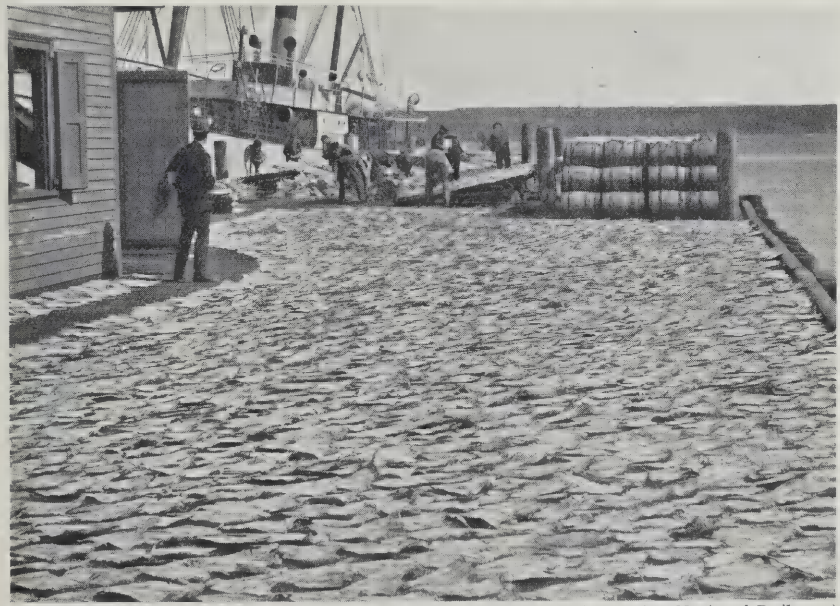


FIG. 124.—THE WORLD. FISHERIES

The second great fishing ground of the world is situated off the shores of eastern Canada and north-eastern United States. Here, as in the Norwegian seas, the chief fish is cod, which find abundant food in the icy waters swept from the Arctic Seas by the Labrador current.

Another important fishing region is situated on the opposite coast of North America. In British Columbia salmon-fishing is the chief branch of the industry. The young salmon hatch out in the lakes high up in the mountains, and swim down the rivers to the sea. Three or four summers later they return to the very lakes in which they were hatched in order to lay their eggs. The fishermen lay in wait for the oncoming shoals with traps, nets and baited hooks and have little difficulty in securing large catches. The fish are cleaned, washed and cut up by a machine known as the " Iron Chink "—so called because its work was formerly done by Chinamen.



(Canadian National Railways)

FIG. 125.—DRYING CODFISH AT HALIFAX, NOVA SCOTIA

The shallow seas around the coasts of Japan rival the European and American fishing grounds in productivity; indeed Japan is second only to the United States among the countries of the world in order of the value of fish landed.

In the southern hemisphere there are rich fishing grounds, but these have not been fully developed as there are no large areas of dense population near by to serve as markets.

Whaling is an outstanding example of those industries which rob Nature. So ruthlessly was the industry carried on in the Arctic Ocean that whales are now very scarce, and the whalers have transferred their attention to the Antarctic. The whales are pursued by small vessels which are equipped with guns for firing explosive harpoons, and with air pumps for expanding the carcases so that they will not sink. Accompanying these "whale-catchers" are larger vessels, on which the whales are cut up and the blubber boiled to extract the oil. The chief headquarters of the whaling fleet is the **Falkland Islands,** off the coast of South America.

EXERCISES

The following tables show the world's chief producers of coal, petroleum and pig iron.

For each of these commodities draw squared paper diagrams showing the production of each country.

(*a*) Coal (Millions of Tons, 1931).

U.S.A.	Britain.	Germany.	France.	Russia.	Poland.	World.
390	220	117	50	48	37	1,030

(*b*) Petroleum (Percentage of World Production, 1932).

U.S.A.	Russia.	Venezuela.	Rumania.	Dutch E. Indies, Borneo and Sarawak.	Mexico.
60	12½	9	3·7	3	2·8

(*c*) Pig Iron (Millions of Tons, 1932).

U.S.A.	France.	Germany.	Britain.	Belgium.	Luxembourg.	World.
8·8	5·5	3·6	3·6	2·7	2	38·8

CHAPTER XX

MANUFACTURING

Fig. 126 shows that nearly all the world's manufacturing is carried on in north-western Europe and in eastern United States. Why have the people in these areas developed the factory system while nearly all the rest of the world is content either to stick to age-old methods or to produce food and raw materials for sale to the factory workers?

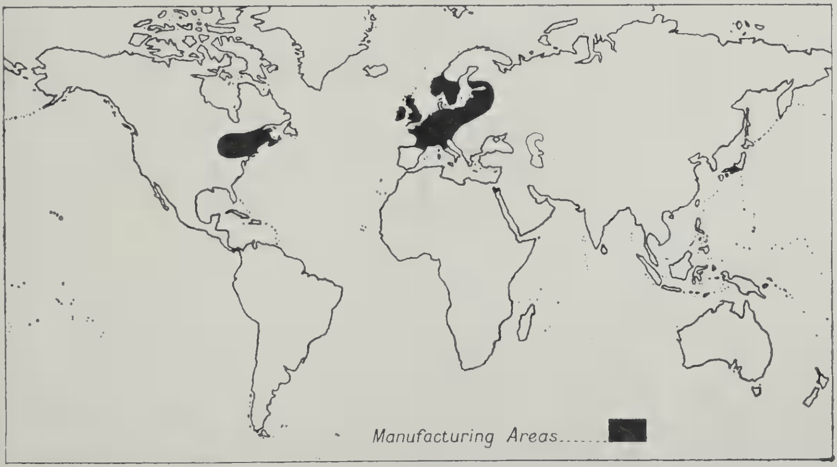


Fig. 126.—The chief manufacturing areas of the world

The chief reason is that the people themselves—Europeans and Americans—have a greater degree of skill, inventiveness and initiative than most other peoples in the world. This is, no doubt, due to something in the "make-up" of the race, which may in turn be due to the fact that we live in a temperate climate. Another very important reason is that in both western Europe and eastern United States coal and iron and other minerals are found fairly close together.

MANUFACTURING AREAS OF EUROPE

On the continent of Europe, as in Britain, the chief manufacturing areas are on or near the coalfields. Fig. 127 shows that most of these coalfields and industrial areas are situated in a belt between the highlands and the lowlands.

(1) **The Franco-Belgian Coalfield** lies at the northern edge of the Ardennes, in the valley of the Meuse and its tributary, the Sambre. Iron ore was formerly mined near the coalfield, and so iron and steel industries grew up at *Liége* and *Namur.* Though nearly all the iron has now to be imported, the industries still flourish in those towns. The chief source of iron ore for the Belgian industries is the Duchy of Luxembourg. In northern Belgium the chief industry is the manufacture of textiles, chiefly linen and cotton.

The French portion of the coalfield centres on *Lille*, and the chief industry of the region is the manufacture of cotton, linen and woollen goods.

(2) **The Ruhr Coalfield** is the only large German coalfield and is, therefore, her chief manufacturing area.

As in the case of Belgium, local supplies of iron ore gave rise to metal manufacturing, and though the iron has now to be imported from Sweden and the Lorraine district of France, the industry has continued there. *Essen*, where the famous Krupp works are situated, is the centre of the industry, and textiles are manufactured in the twin towns of *Barmen* and *Elberfeld.*

(3) **Saxony,** the second great industrial area of Germany,

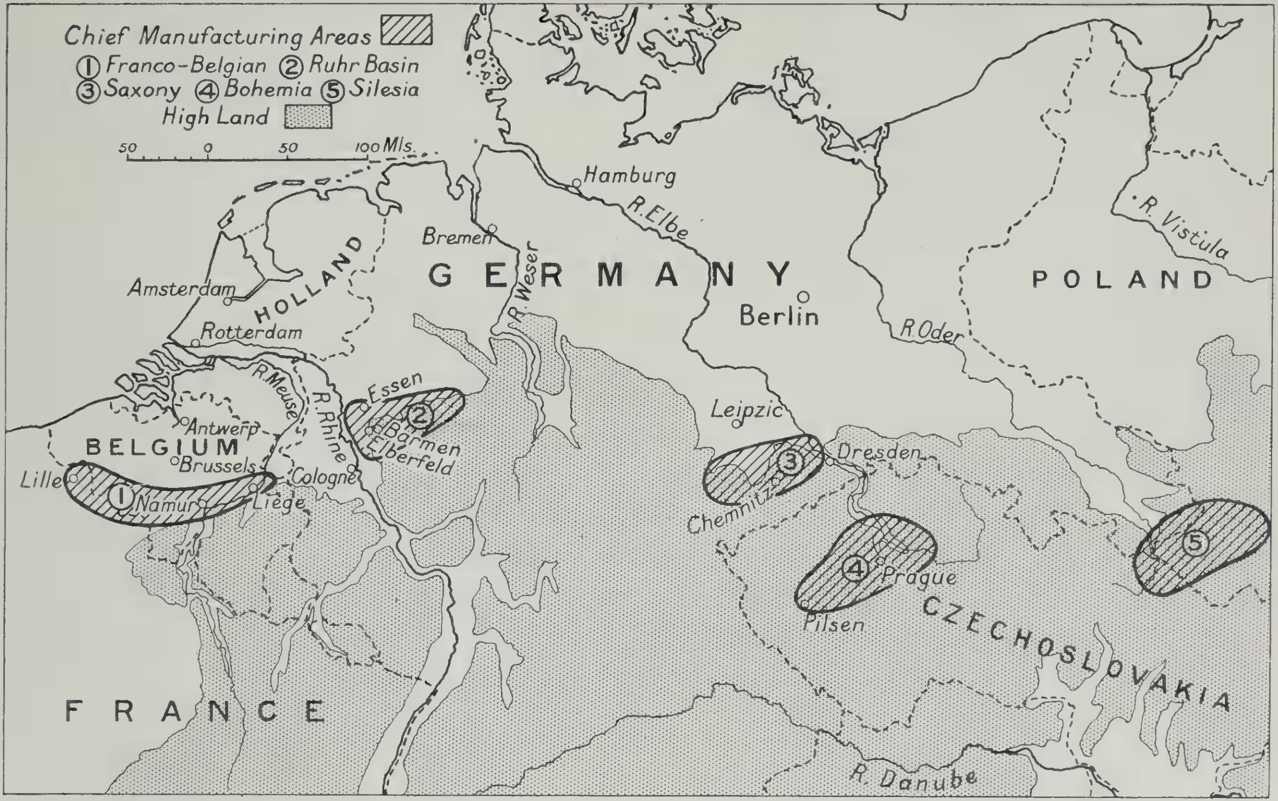
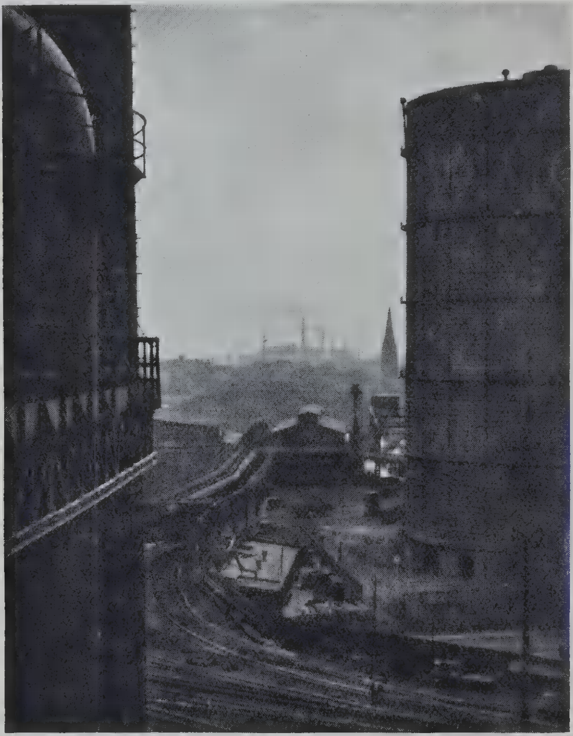


FIG. 127.—THE CHIEF MANUFACTURING REGIONS OF EUROPE

was noted for its manufactures long before coal was used as a source of power. In modern times its small coalfield cannot supply all the power needed by its factories. To the north-west, however, there are large deposits of "brown coal" or lignite. Formerly these were considered of little value, but they are now used for the generation of electricity, thus making up for the deficiency of real coal. *Chemnitz*, the chief industrial town of the area, manufactures textiles, metal goods and glass.



(*E. O. Hoppé*)

FIG. 128.—INDUSTRIAL SCENE IN THE RUHR DISTRICT

(4) **Bohemia,** which is the most prosperous part of Czechoslovakia, has one or two small coalfields, as well as supplies of iron ore. These, together with the energy and skill of the people, have favoured the development of

manufactures. *Pilsen* and *Prague* are the chief industrial cities, while *Zlin* has some of the world's greatest boot and shoe making factories.

(5) **Silesia** is the district situated in the angle between the Bohemian plateau and the Carpathians. The Silesian Coalfield, one of the largest in Europe, is shared by Poland, Czechoslovakia and Germany, though the last-named country has now only a very small portion of it. Near by, at the foot of the Carpathians, Poland has large supplies of iron, zinc, salt, potash and petroleum, so the coalfield is rapidly being developed as a manufacturing area.

(6) **Russia** is now making great efforts to develop her manufacturing industries. Her chief coalfield lies in the valley of the Donetz and near by are rich deposits of iron ore. At Dnieprostroy a dam on the river Dnieper has been built to serve the double purpose of making the river navigable and supplying a " head " of water for the generation of hydro-electricity. With this combination of coal, iron and electricity the Soviet Government expects to be able to make this region one of the greatest industrial areas in the world. *Kharkhov* is the chief manufacturing centre.

Russia has another coalfield round *Tula*, and though the coal is of poor quality, it is used by the textile factories of Moscow. In the Urals there are large supplies of iron, copper and other minerals, and it is part of Russia's " Five-Year Plans " to develop engineering industries in this region.

MANUFACTURING IN THE UNITED STATES

In the previous chapter we learnt that the United States lead the world in the production of coal, oil, iron, copper, lead and zinc. It is not surprising, therefore, that she has become the leading manufacturing country in the world. The chief industrial areas (see fig. 129) are :

(1) **The New England States.** This region has a great variety of industries, but is specially noted for the manufacture of cotton goods, the chief centres being *Fall River* and *New Bedford.* This region produces no coal, no iron, and very little raw material, yet it is the chief manufacturing district in the United States. One reason for this is that it was the first part to be developed by colonists, and so got an early lead over other districts ; another reason is that, having good ports, such as *Boston*, and being well served by railways, it can easily assemble all the materials required by its industries and can easily transport them to " markets " either within the United States or in foreign countries.

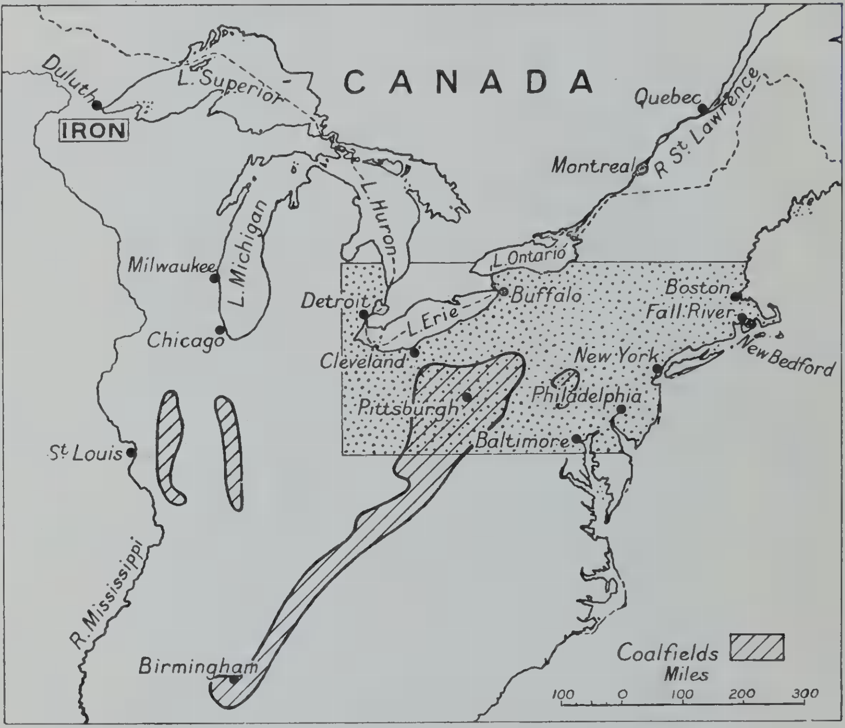
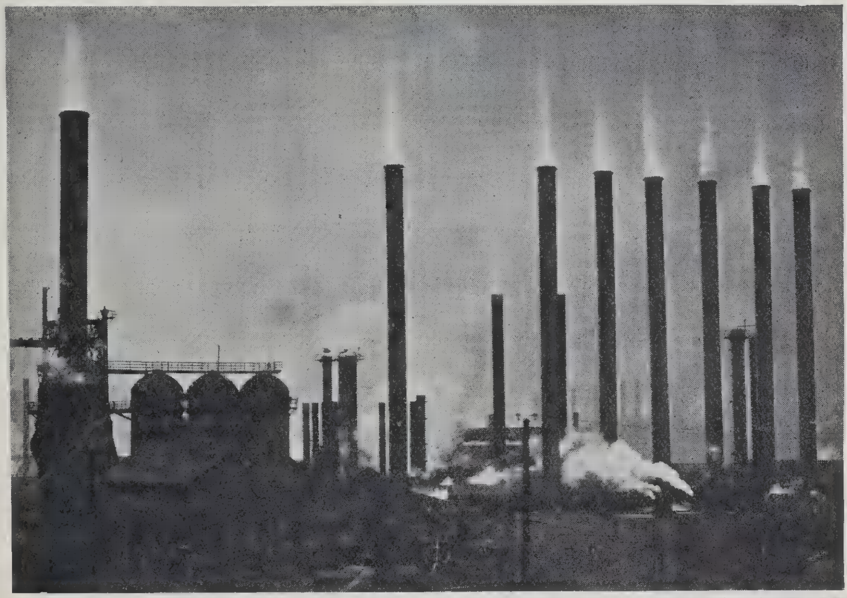


FIG. 129.—COALFIELDS AND MANUFACTURING AREAS OF EASTERN UNITED STATES

(Two-thirds of the manufacturing of U.S.A. is done in the dotted area.)

(2) **The Mid-Atlantic Coastal Plain.** Like New England, this region produces little raw material but has the advantage of easy transport by land and sea. *New York* is the largest city, the chief port, and the busiest manufacturing centre in the New World. It owes its importance to its excellent harbour, and to the control of the route to the Great Lakes by the Hudson Valley. It specialises in the manufacture of clothing, machinery, foodstuffs and luxuries.



(*E. O. Hoppé*)

FIG. 130.—"TORCHES OF INDUSTRY." STEEL WORKS AT PITTSBURGH

Philadelphia, the third city of the United States and one of its chief ports, has a large shipbuilding industry and many textile factories.

Baltimore is a great rival of Philadelphia both as a port and a manufacturing centre. In addition to shipbuilding and textile industries it has a great engineering industry.

(3) **The South Atlantic States.** This district has the

advantage of local supplies of coal, iron and raw cotton. In recent years the cotton industry has grown enormously in the Carolinas and in Georgia, chiefly because the people are willing to work long hours for low wages, so giving the employers a great advantage over those in New England where wages are high and the working week short.

(*Empire State Incorp.*)

FIG. 131.—THE EMPIRE STATE BUILDING, NEW YORK

(This is the tallest structure in the world)

Birmingham in Alabama has become one of the world's greatest iron and steel manufacturing centres, since the three raw materials required for the industry—coal, iron ore and limestone—are all mined in the neighbourhood.

(4) **The Pittsburgh District.** This is still the chief iron-smelting and manufacturing area in the United States. The industry arose there because both coal and iron occur in the locality. Nowadays, however, all the iron ore is brought from the head of Lake Superior, where it occurs in thick seams close to the surface. Mining is done by means of steam navvies which scoop up

five or six tons of ore at a time and tip it into the waiting wagons.

(5) **The Lake-side Towns.**—Of the thirteen cities in the United States which have more than half a million inhabitants, five are ports on the Great Lakes route.

Chicago, situated near the southern end of Lake Michigan, is the second largest city in U.S.A., and the fourth city in the world. It is the greatest railway centre, the greatest grain market and the greatest meat-packing centre in the world.

Milwaukee, on the western shore of Lake Michigan, manufactures metal goods and agricultural machinery, and has many flour mills and meat-packing factories.

Detroit, situated on the waterway connecting Lake Huron with Lake Erie, is the world's greatest centre for the manufacture of motor cars, the principal Ford motor factories being situated there.

Cleveland, the chief port on Lake Erie, is engaged chiefly in the iron and steel industries, iron ore being brought from Lake Superior and coal from Pittsburgh.

Buffalo is situated where the land route from New York meets the Great Lakes route. As it can easily collect raw materials, and is supplied at low cost with electricity from Niagara, it has developed many industries, the chief of which are meat packing, flour milling and oil refining.

EXERCISES

1. The following table shows the percentage of workers in certain countries who are engaged in manufacturing and mining.

England.	Belgium.	Germany.	Czecho-slovakia.	U.S.A.	France.
47	46	41	37	33	30

On squared paper draw columns 2 ins. high to represent the above countries and on each shade the portion representing the percentage engaged in mining and manufacturing.

2. If you live near a factory, try to find out what raw materials are used, where they come from, and where the finished articles are sent.

3. Keep newspaper cuttings which describe new industrial developments in Russia.

CHAPTER XXI

POLITICAL DIVISIONS OF THE MODERN WORLD

A POLITICAL map of the world is a bewildering patchwork of colours representing several scores of countries. On such a map, however, five political divisions stand out very prominently. These are, in order of size, the British Empire, Russia, the French Empire, the United States of America, Brazil, and China. Together these five political divisions occupy two-thirds of the total land surface of the globe.

I. **THE BRITISH EMPIRE** contains over a quarter of the land surface of the world, and nearly a quarter of the world's people. Its various parts are scattered all over the world and differ greatly in size, climate, degree of civilisation and methods of government. Only two things hold the Empire together—steamship routes and the loyalty of the people to the Empire and to the Mother Country.

The different parts of the Empire may be grouped into five great divisions :

(1) **The Dominions,** viz. the *Irish Free State*, *Canada*, *Newfoundland*, the *Union of South Africa*, *Australia* and *New Zealand*. All are self-governing countries which rank as free and equal partners within the Empire. With the exception of *Canada* and *South Africa*, the inhabitants are practically all of British descent. In *Canada* more than a quarter of the total population and seven-eighths of the people of the province of Quebec are descended from the original

French settlers. Though they still speak the French language and retain many of the French customs, they are not in the least degree French, but are loyal citizens of the British Empire. In the Union of South Africa, which comprises the Provinces of Cape of Good Hope, Natal Orange Free State and Transvaal, more than two-thirds

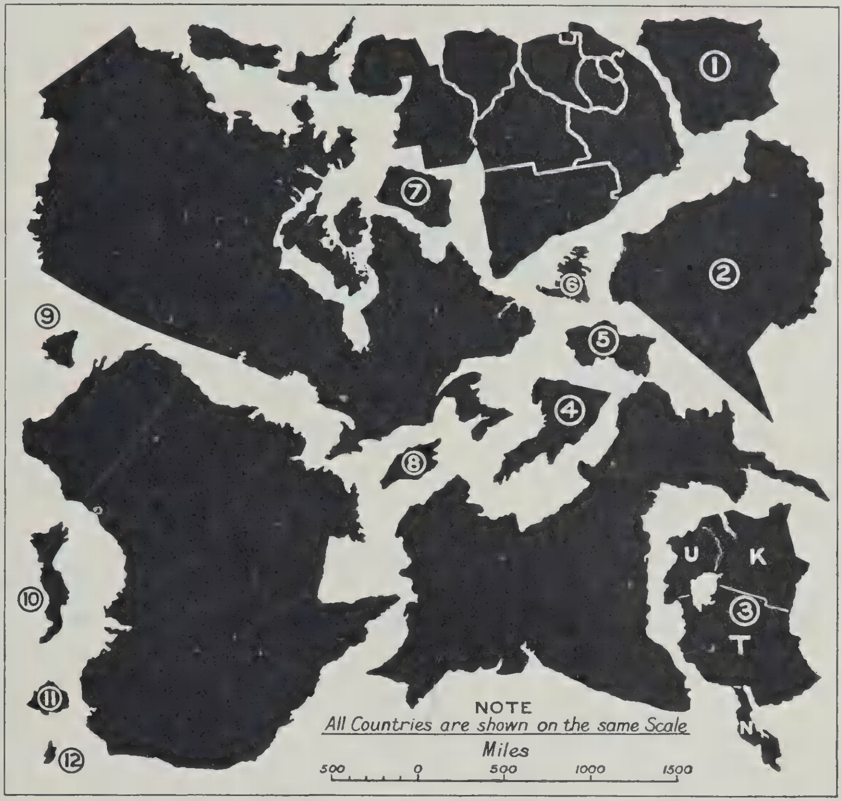


FIG. 132.—THE BRITISH EMPIRE

CLUES

(1) Is drained by the R. Niger.
(2) Is governed by Britain and Egypt.
(3) U, K, T, N, indicate parts of British East Africa.
(4) Sometimes called Papua.
(5) In South America.
(6) Discovered long ago, yet called 'New.'
(7) Once famous for gold, now for cocoa.

Jumbled Letters

(8) YAMALA (a peninsula).
(9) AMASAINT (part of Australia).
(10) ASKAWAR (part of an island).
(11) RAISER NOELE (in Africa).
(12) PYCRUS (in the Mediterranean).

of the people are "natives," while about half of the white population are of Dutch descent.

The six self-governing Dominions are, of course, the "backbone" of the Empire. As we have seen, we depend on them for a very large proportion of our food and raw materials, and for markets for our manufactured goods. Moreover, the high position which Britain holds among the nations of the world is due in great measure to the strength and prosperity of these "sister nations."

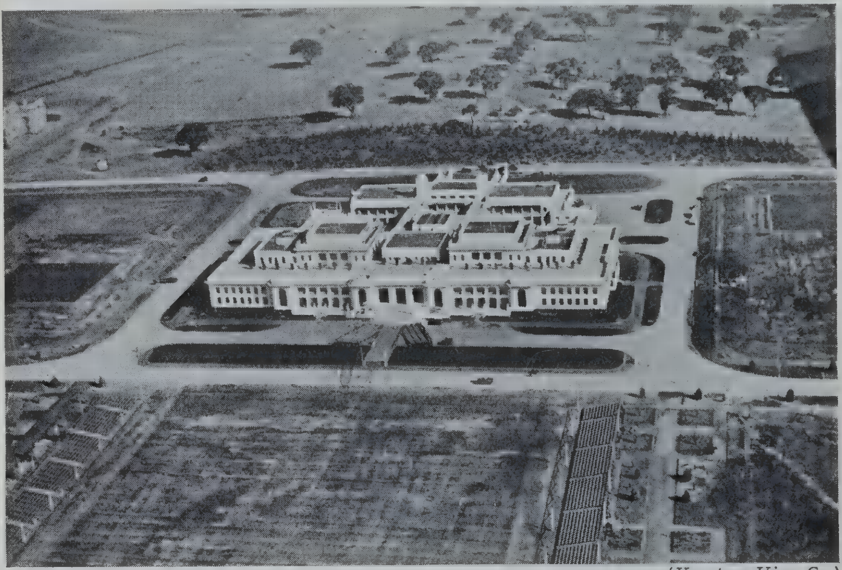
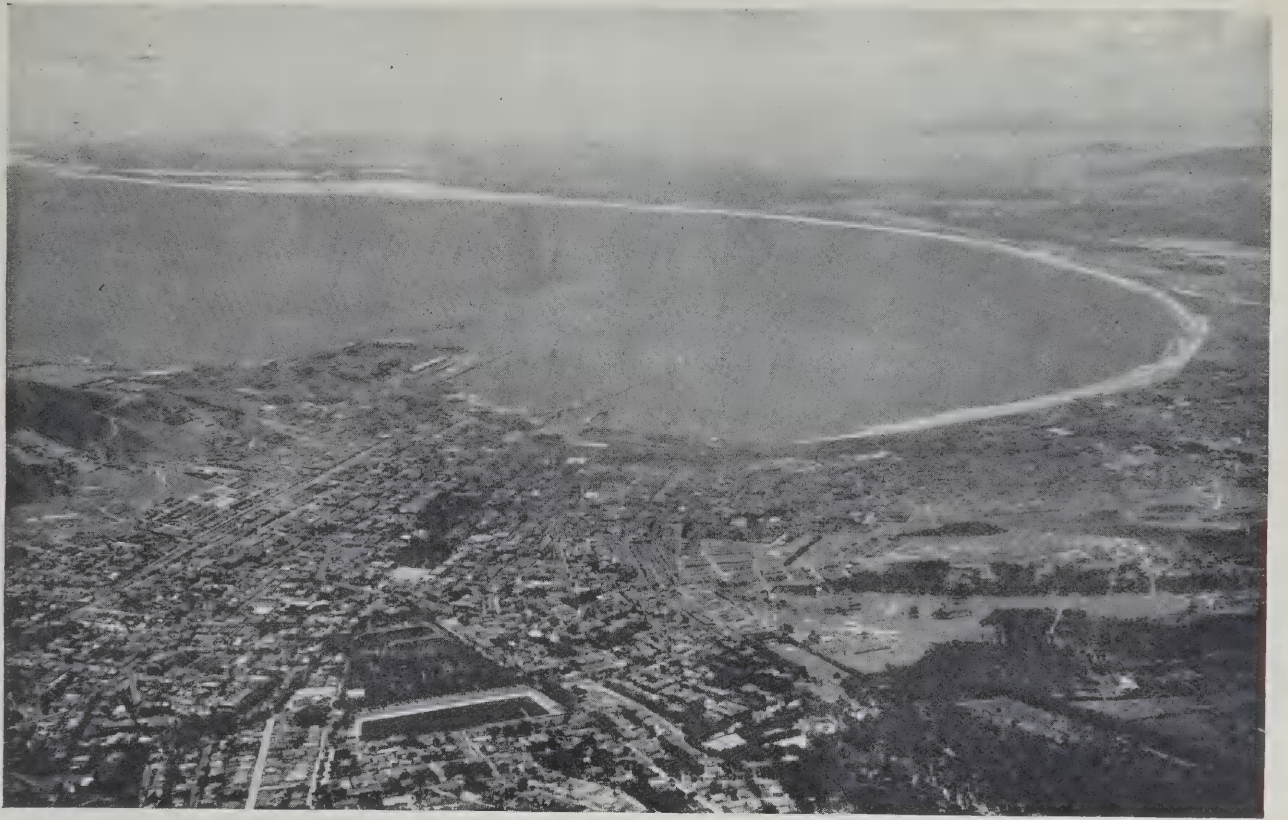

(*Keystone View Co.*)

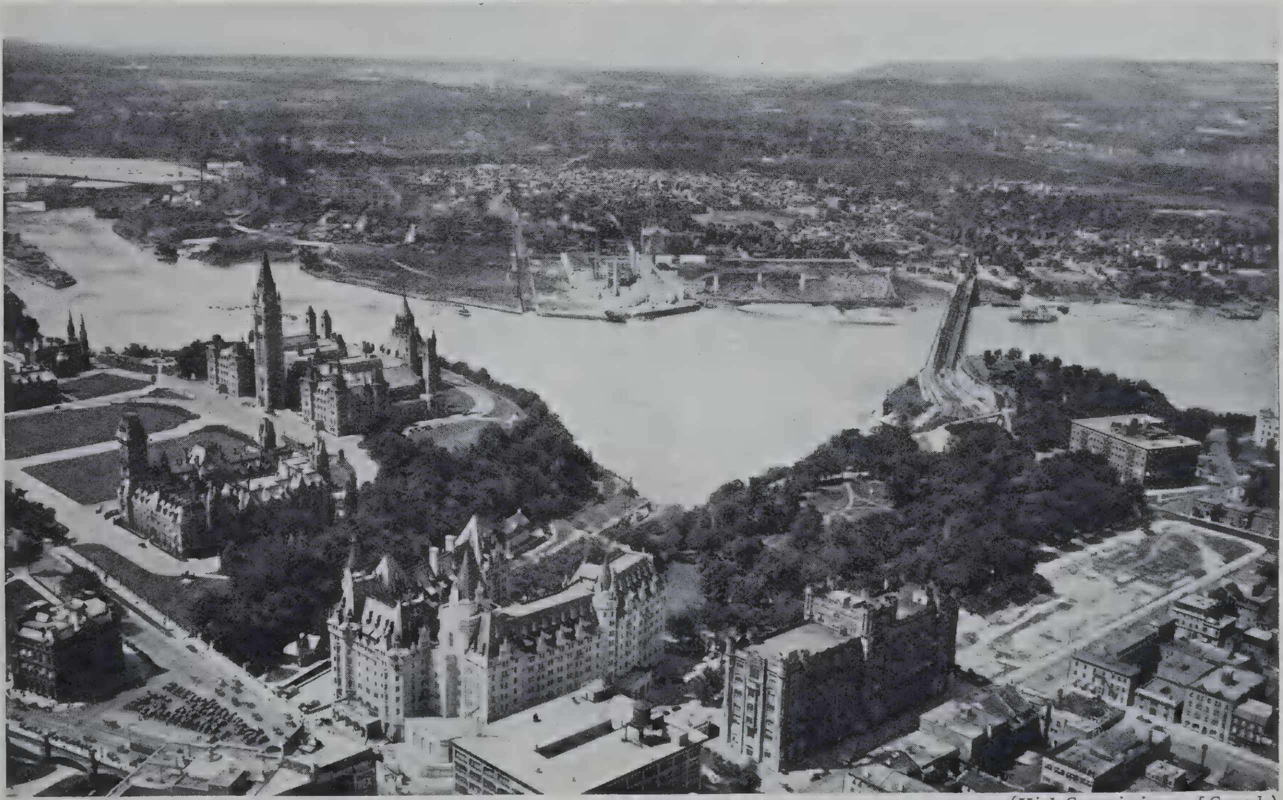
FIG. 133.—CANBERRA

(2) **India,** which is too large and too varied to be called a country, yet too small to be called a continent, falls into a class by itself. Some parts of it are Native States which are ruled by their own princes under the guidance of British officials. The rest, which is known as "British India," was until recently ruled almost entirely by British representatives. In modern times the 320 million native inhabitants of India have demanded a greater share in the



(South African Railways)

FIG. 134.—CAPE TOWN AND TABLE BAY FROM TABLE MOUNTAIN



(*High Commissioner of Canada*)

FIG. 135.—AERIAL VIEW OF OTTAWA

government of their own country, and arrangements are being made to enable them to manage their own affairs. One very great difficulty is that the Moslems and the Hindus, who make up respectively one-sixth and two-thirds of the population, do not get on well together.

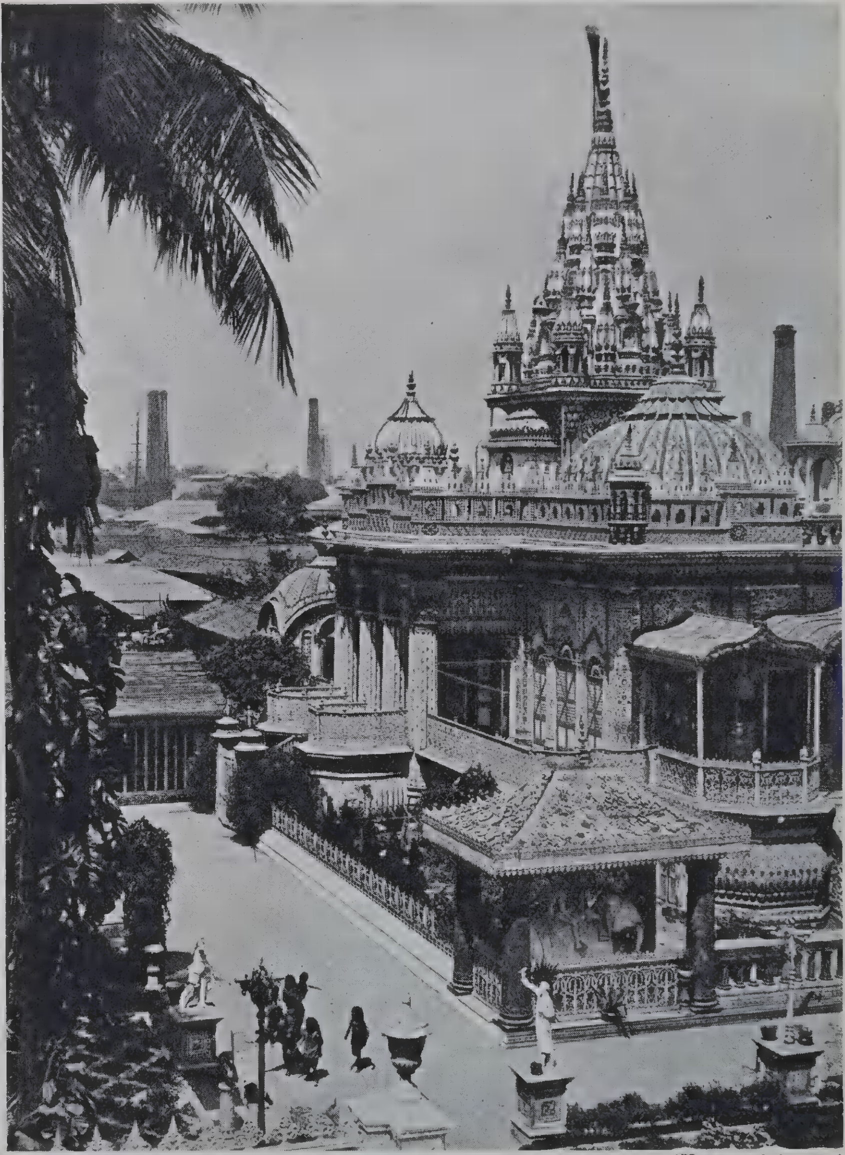
(3) **"Possessions,"** some of which are called *Protectorates*, some *Dependencies*, and some *Crown Colonies*. In practically all of them the great majority of the people are natives who have not advanced far on the road to civilisation. Consequently the government is in the hands of British officials who are responsible to the British Government.

To this class belong the Anglo-Egyptian Sudan, the British East African territories, the British West African territories, Nyasaland and Rhodesia in Africa; Jamaica and other islands in the West Indies; British Guiana in South America; and the Malay States and Straits Settlements in south-eastern Asia.

(4) **Mandated Territories.**—By the Peace Treaties which followed the Great War Germany lost all her colonies. These, together with certain areas in Asia which had been ruled by Turkey, were divided between Britain, France and Italy. These three countries, however, did not receive the right to rule the lands so apportioned as they liked; instead they were given a "mandate" from the League of Nations to rule the lands for the benefit of the native inhabitants. Such areas are, therefore, known as "mandated territories," and the countries ruling them are responsible to the League of Nations for their good government.

Tanganyika, in East Africa, and Palestine are the chief British Mandates; South-west Africa is under the mandate of the Union of South Africa, and part of New Guinea is ruled by Australia.

(5) **Military posts, naval stations and coaling stations,** such as Gibraltar, Aden and Singapore. The importance of these is out of all proportion to their size, for they guard the sea-roads to our colonies and dependencies, and store reserves



(*Keystone View Co.*)

FIG. 136.—WONDERS OF INDIAN ARCHITECTURE
A TEMPLE AT DELHI

(In the background can be seen chimneys, a sign of the modern times) of coal and oil for our mercantile and naval fleets. Some of them, such as Singapore, situated on an island off the southern end of the Malay Peninsula and Victoria on the island of Hong Kong, have become great trading centres.

II. **THE FRENCH EMPIRE** is the second largest Colonial empire in the world. It is, however, only about one-third the size of the British Empire; it contains no great self-governing dominions; and its tropical portions are not nearly so productive as those of the British Empire.

The African possessions of France comprise about nine-tenths of her Empire. The most important parts are *Morocco*, *Algeria* and *Tunisia*, in north-west Africa. These are separated from the French possessions in West and Central Africa by the Sahara Desert, which is also mainly under French control. Great efforts are being made to link up these possessions by means of aeroplane and motor routes across the Sahara.

Madagascar is a densely forested tropical island, which, though at present thinly peopled and unhealthy, may some day be made very productive.

The chief French possessions in Asia are grouped together under the name of *French Indo-China*. *Syria*, at the eastern end of the Mediterranean, is a mandated territory.

III. **THE UNITED STATES** is the richest and most powerful country in the world, and though she has no large "possessions," except Alaska, she is the fourth largest political division in the world.

Her prosperity is due mainly to her stores of coal, iron and petroleum, and to her great production of wheat, maize, cotton, meat, fruit, and so on. During the present century, however, she has extended her influence far beyond her own boundaries. The West Indian islands of Cuba, Haiti and Porto Rico are now entirely under her control, and several of the Republics of Central America acknowledge her leadership. In Mexico and South America her business men have invested so much money and secured such a large share of

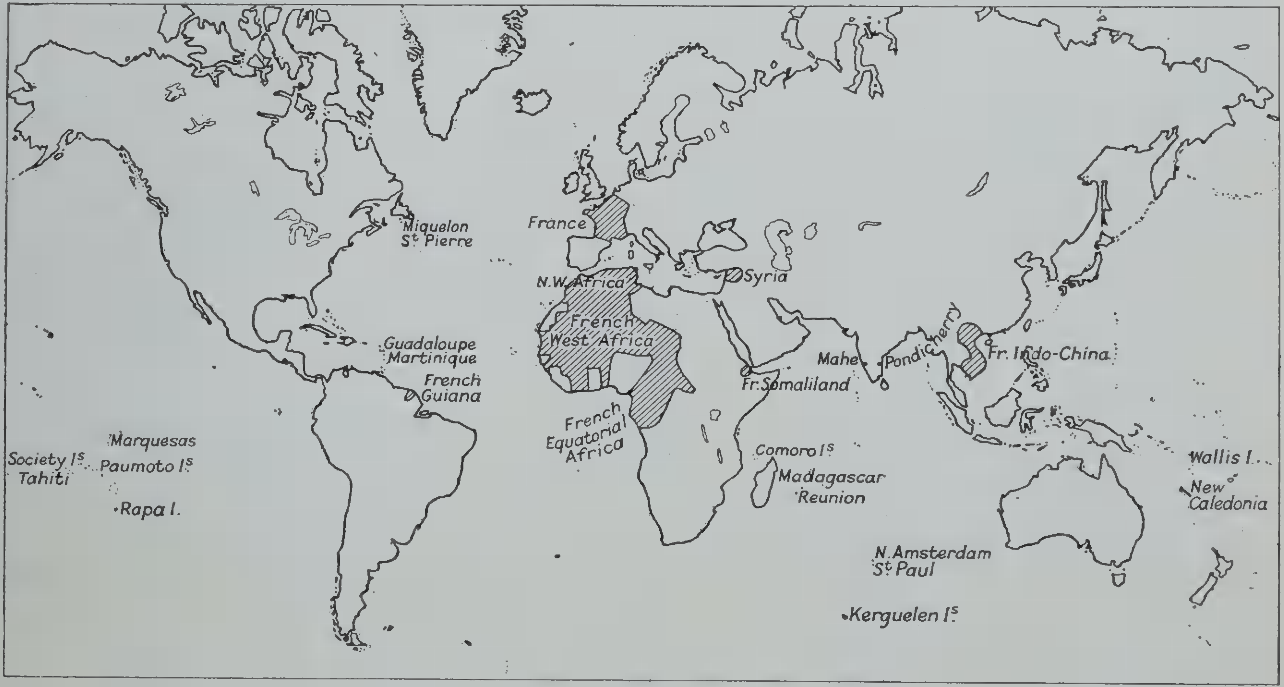


FIG. 137.—THE FRENCH EMPIRE

the trade, that these territories are almost as good as colonies to the United States. Even Canada, in spite of her close association with the Motherland, does more trade with the United States than with our own country.

So we see that we must not measure the importance of the United States simply by her vast size, for she controls the greater part of the two continents of North and South America. The Panama Canal, which was opened in 1914, has greatly helped her to secure this control. It not only forms a link between her eastern and western shores, but also makes it easier for her to trade with the countries on the western side of South America. For example, before the Canal was opened, the only sea route between New York and Valparaiso was that *via* Cape Horn—a distance of nearly 9,000 miles, while the route *via* the Canal is only 5,000 miles long.

IV. **RUSSIA,** or to give it its full title, the Union of Socialist Soviet Republics (U.S.S.R.), is unlike any other country, since it is run on a " communistic " plan.

Everything belongs to the State ; farms, factories, mines, railways and all other means of production and transport are directed by the Government. In addition to the coal and iron of the Donetz Basin and the metals of the Urals, Russia has a rich oilfield on the shores of the Caspian Sea and one of the largest coalfields in the world in Siberia. The latter region has also the greatest area of coniferous forest in the world, and is, moreover, very rich in metal ores. Up to the present the natural wealth of Siberia has remained almost untouched, but it is quite possible that Russia as a whole may in the future be as productive as the United States. The great need at present is for better means of transport, and the second " Five-Year Plan " includes many schemes for the building of roads and railways to help in the development of the mining and manufacturing industries.

V. **THE FAR EAST.**—Though China is much the largest country in the Far East, she is not by any means the most powerful. That position is undoubtedly held by Japan. Less than seventy years ago the Japanese decided to change her age-old civilisation and become a great manufacturing and commercial nation. Representatives were sent to western countries to learn all they could about industrial methods, and on their return these men supervised the building of factories, railways and steamships. The Government also felt that it was necessary for them to have an army and a navy to match those of European Powers. The army was modelled on that of Germany and the navy on that of Britain. After defeating first China and then Russia, Japan was established as one of the Great Powers of the world. She cannot, however, produce from her own territory all the raw materials required for her industries, or all the food needed by her people.

(Wide World Photos)

FIG. 138.—" HOUSE OF INDUSTRY," CHADKOW, RUSSIA

She has, therefore, long desired possession of the Chinese province of Manchuria, which is very rich in coal, iron and other minerals, besides having vast areas of undeveloped agricultural land.

In 1931 and 1932, in spite of the opposition of America and the League of Nations, she made the weakness of the Chinese Government an excuse for military operations which made Manchuria practically a Japanese possession. The name of the province was changed to Manchukuo, and a new government, entirely under the control of Japan, was set up. Early in 1933 Japan also drove the Chinese armies out of the province of Jehol, and so obtained control of all the Chinese territory north of the Great Wall.

THE LEAGUE OF NATIONS

The Great War was such a great disaster for everybody concerned, that all right-thinking men and women decided that it was essential to prevent war breaking out in the future. So the peoples of the world, victors and vanquished, joined together in the League of Nations, the *Covenant* or Charter of

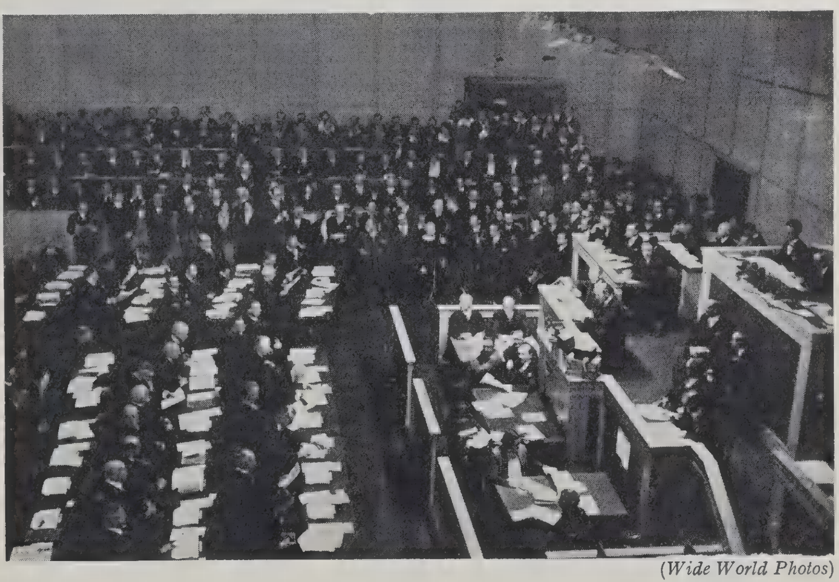

(*Wide World Photos*)

FIG. 139.—OPENING OF THE DISARMAMENT CONFERENCE AT GENEVA

which binds its members not to resort to war before submitting the dispute to the League. Since then all the important countries of the world have signed the *Kellogg Pact*, which goes even further than the Covenant, by binding the nations not to resort to war at all " as an instrument of policy."

Unfortunately, two of the greatest political units in the world—Russia and the United States—are not members of the League, and Japan has resigned as a result of the League's condemnation of her action in Manchuria.

Though the League is not yet as strong as many people would like it to be, it has a splendid record. It has settled many disputes which might easily have caused war between nations ; it has helped bankrupt countries on to their feet, relieved famine distress in many districts which were laid waste by the War, and suppressed many evils which the nations acting alone could not have tackled ; and, although it has not yet succeeded in its greatest task of all—that of getting the nations to agree to a sweeping reduction of armaments—it is the most powerful organisation for peace between nations that the world has ever known.

EXERCISES

1. Solve the "puzzle-map" on p. 189. Trace each portion of the Empire and redraw it in its correct position.
2. Make a similar " puzzle-map " of the French Empire.
3. Keep newspaper cuttings which tell of the work of the League of Nations.
4. Compile from newspaper reports a record of events in the Far East.

SECTION III—HOW BRITAIN IS LINKED TO THE EMPIRE AND THE WORLD OF TO-DAY

CHAPTER XXII

MUTUAL AID

The primitive peoples of the world and the hundreds of millions who live in the rice-lands of south-eastern Asia, depend directly on the produce of their own labour. But we advanced peoples of the modern world can live only by working for others and persuading them to work for us. The products of our factories are sent to the remotest corners of the earth, and we ourselves depend upon the labours of people in far-distant lands.

However poor we may be, when we consider the things we eat, wear and use in the course of a day, and try to trace their origins, we shall see that our servants are innumerable, and that they scour the whole earth to provide us with the necessaries of life.

Begin with the breakfast you had this morning. No doubt your mother or the local baker made the bread you ate. But who grew the wheat ; who ground it into flour ? From which farm came the milk ; from which factory the kitchen utensils or the machinery used in making the bread ? Who laboured to ensure the pure water supply ? Who descended into the bowels of the earth to dig the coal which heated the oven ? Is it possible to count the people whose services have helped to provide even a single loaf of bread ?

Perhaps we had better go back to the beginning, as we do when we have read through a complicated example in arithmetic. How many hands and brains were engaged in the growing of the wheat? Those who have read the earlier books of this series will know something of the cultivation of wheat at home, in Australia, in Argentina, and in Canada. Quite possibly our loaf was made from wheat grown in all these places, for the miller mixes different varieties of wheat to obtain the flour most suitable for bread-making. But let us simplify matters, and suppose all the wheat was grown on the prairies of Canada. In our mind's eye we can see the wheat as it ripens in the field, we can picture the processes of harvesting and threshing, and follow the grain as it is carted to the station, loaded into trucks, elevators and ships, and brought across the Atlantic, until it reaches the miller, and finally becomes the fine white flour from which our bread is made. Farmers, transport workers, seamen, millers, merchants and clerks all have their share in providing the bread for our tables. But even these do not exhaust the list. Must we not go back into history, and think of the early pioneers who opened up the wheat lands, of men like David Fife who discovered new types of wheat, and even of those who, before history began, first sowed and tended the wild grasses from which the wheat plant is descended?

Reflections such as these show us that it is impossible for us to count the persons to whom we are indebted for the commonest article of diet. So it is with almost everything we eat or drink, with the clothes we wear, with the instruments and utensils we use, indeed with all those things the possession of which distinguishes us from the most primitive savages; each article brings to the mind's eye a picture of the world at work.

Though the workers of the world contribute to our welfare, they do not, of course, give their services free. We ourselves must labour to provide for other peoples the things of which they are in need. Broadly speaking, we depend on other countries for our food and raw materials, and in exchange for these we supply manufactured goods. In the next few chapters we shall see how the exchange of such commodities links Great Britain with the Empire and with the rest of the world.

CHAPTER XXIII

OUR FOOD SUPPLIES—WHEAT

If we had to depend entirely upon home-grown wheat we should have bread enough for one day in the week only! **Canada** does more than any other country to make up our deficiency. Of the 5,800,000 tons of wheat and flour which we imported in 1931, Canada supplied more than a quarter. The *Prairie Provinces* of the Dominion—Manitoba, Saskatchewan and Alberta—may, indeed, be called "Britain's bread basket." Practically all the wheat grown in these provinces is spring wheat. The seed cannot be sown until May or June, for the ground is frozen hard during the long, cold winter, and as the grain must be harvested before the first frosts of autumn, the growing season is a short one—in many parts only 110 days. Special types of wheat, which will ripen within this short period, and others which require little rain, have been introduced during the present century, and it is largely to these new varieties that Canada owes her present predominance as a wheat-exporting country.

After the harvest the Canadian wheat crop is stored in grain elevators which are to be seen at intervals along the Canadian Pacific and the Canadian National Railways.

Most of the wheat passes through *Winnipeg* and then through the twin ports *Fort William* and *Port Arthur*, which are situated at the head of Lake Superior. From these termini some of the wheat is sent by rail to *Montreal*, some by water to the same port, and some by water and rail to *New York*.

Since the opening of the Panama Canal in 1914, *Vancouver* became an important wheat port. Sea transport is so much cheaper than land transport that it actually costs less to send goods from Alberta to London *via* Panama than *via* Montreal, although the former route is the longer by 4,000 miles.

Within the last few years *Churchill*, on Hudson Bay, has also been developed as a wheat port. The bay is open to navigation for only two months, but this gives time for wheat to be shipped after the harvest and before the closing of navigation by the ice. The Hudson Bay route has the advantage of being the shortest route between the Prairie Provinces and Europe.

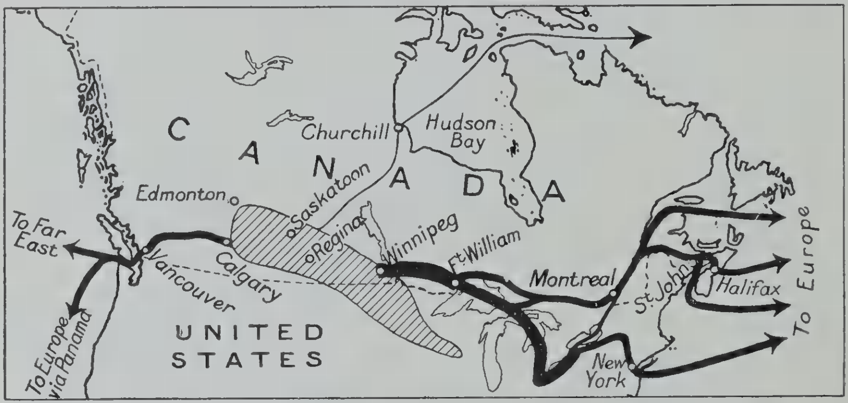


FIG. 140.—THE WHEAT REGION OF CANADA, AND EXPORT ROUTES

Argentina also supplied us with large quantities of wheat. The chief wheat lands stretch in a crescent from Rosario to Bahia Blanca. The wheat lands are part of the *pampas*, which, like the prairies of North America, were formerly great grass lands.

The wheat-growing industry of Argentina differs greatly from that of Canada. In the former country the winters are warm and moist and plant growth continues throughout the year; but against this advantage must be set the fact that Argentine wheat is grown chiefly by poorly paid labourers, who do not obtain such good results as the skilful and hard-working Canadian farmer. Consequently the yield per acre in Argentine is only two-thirds of that in Canada.

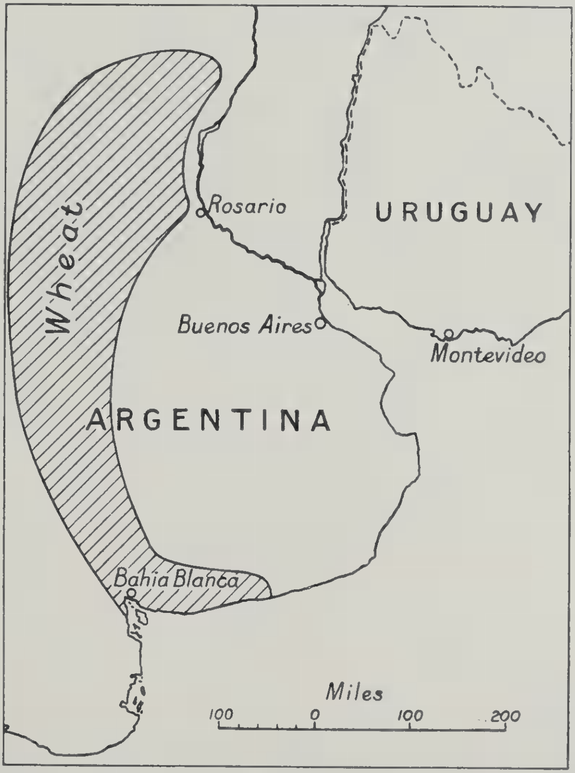


FIG. 141.—THE WHEAT LANDS OF ARGENTINA

Another difference between the wheat industries of the two countries is in the methods of marketing. Canadian wheat is carefully cleaned and graded, and while awaiting shipment is stored in elevators to maintain it in good condition. In Argentina less care is taken with the crop and, although there are now grain elevators at the wheat ports—*Rosario*, *Buenos Aires* and *Bahia Blanca*—one frequently sees at the country stations stacks of bagged wheat exposed to the sun and rain.

Australia is, next to Canada, the chief wheat-exporting country of the British Empire. The *Murray-Darling Basin* is the largest wheat-growing area in the Commonwealth.

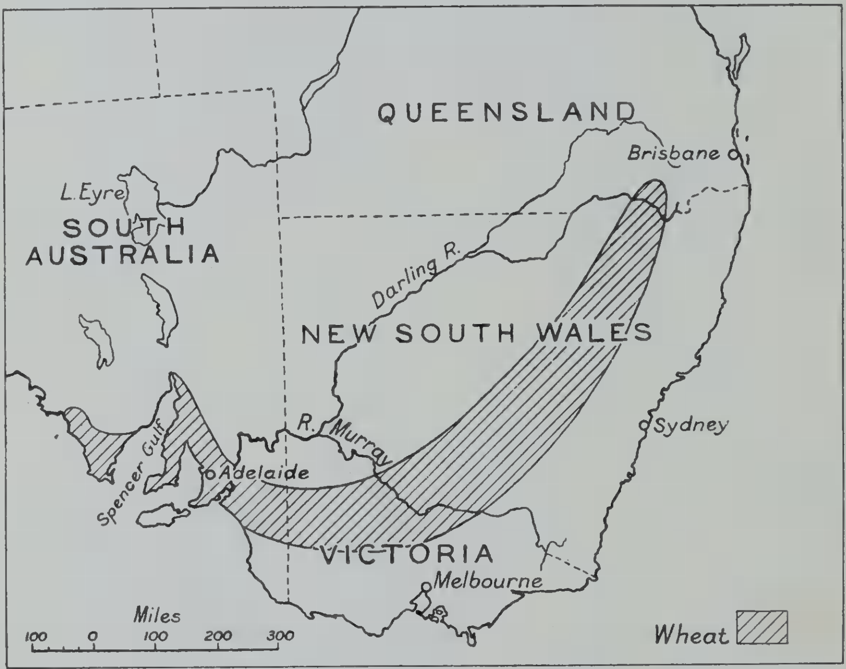


FIG. 142.—THE WHEAT REGION OF S.E. AUSTRALIA

Like the pampas and the prairies this region belongs to the temperate grass lands of the world, and as it is in the rain-shadow of the Great Dividing Range it has the rather dry climate suitable for the cultivation of wheat. In many districts, indeed, the rainfall is too low to allow wheat to be grown by ordinary methods. In such districts "dry-farming" is adopted. With this type of farming the ground lies fallow for a year, but is ploughed and harrowed to keep in as much moisture as possible, ready for the crop which is grown during the second year.

The "*Mediterranean*" *Districts* of Australia, *i.e.* the districts around Perth and Adelaide, also grow large quantities of wheat. Like all "Mediterranean" districts they have warm, moist winters and hot, dry summers. The wheat is sown in winter and harvested in early summer.

Australia, like Argentina, has an advantage in the fact that her wheat is ready for the market in the northern winter, when most of the Canadian wheat has been sold.

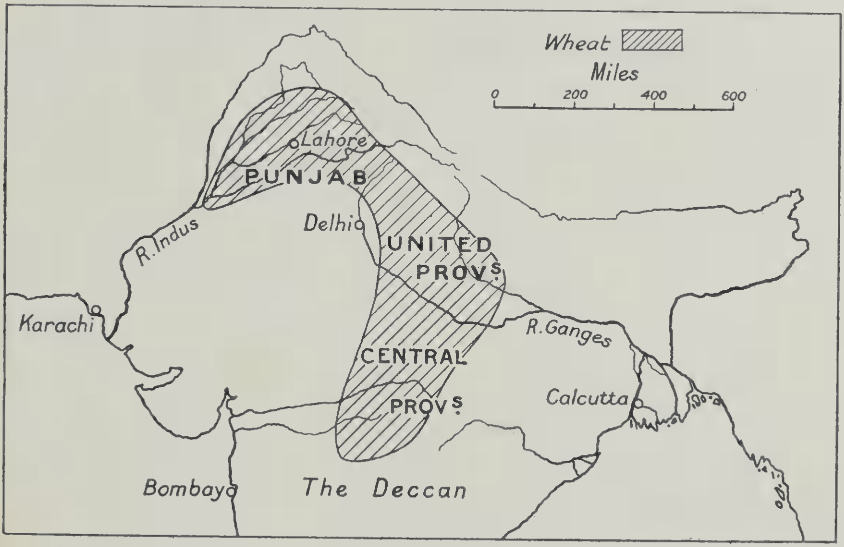


FIG. 143.—WHEAT-GROWING AREAS OF INDIA

India is another source of Empire-grown wheat. The best wheat lands are in the *Punjab*—the land watered by the five tributaries of the Indus. As the summers are very hot and rather moist, the wheat is grown in winter and is harvested in early spring. Nowadays the peasants of the Punjab eat much more wheat than formerly, so that in most years there is not now a great surplus for export.

Southern Russia was the "granary of Europe" before the Great War, but for many years after the Revolution which placed the Bolsheviks in power she was unable to grow enough to feed even her own people. Now, as a result of the "Five-Year Plans," she is again selling large quantities of wheat to this and other countries. The communistic methods of farming have already been described on p. 167.

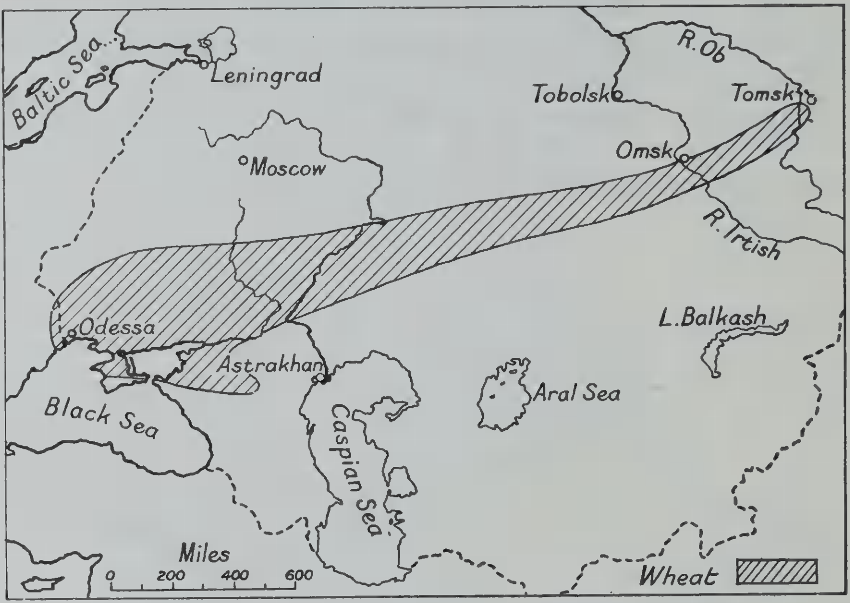


FIG. 144.—THE WHEAT-GROWING AREA OF RUSSIA

EXERCISES

1. The following table shows our imports of wheat in 1930. Name the countries on a map of the world and draw from each to Britain a line roughly proportional in width to the amount of wheat sent to us.

Country.	Canada.	U.S.A.	Russia.	Argentina.	Australia.	India.
Exports to U.K. (thousand tons)	1,300	1,000	900	750	600	150

2. Draw a squared paper diagram to show the production of wheat in various countries (1930).

Country.	Russia.	U.S.A.	Canada.	India.	Argentina.	Australia.	World.
Amount (million tons)	29	23	10	10	6	5	120

(Let five small squares, each $\frac{1}{10}$ in. side, stand for one million tons ; draw a rectangle 3 ins. by 2 ins. to represent the world production, and mark off within this the production of the various countries.)

3. India's exports of wheat are only one-fortieth of those of Canada, though her production is equal to that of Canada. Give a reason for this.

CHAPTER XXIV

OUR FOOD SUPPLIES—MEAT AND DAIRY PRODUCE

ALTHOUGH our mild, moist, equable climate is suitable for cattle rearing and dairy farming, we are dependent on other countries for a large proportion of our meat and dairy produce. The reason for this is that our population is very large in proportion to the amount of farm land.

MEAT

Beef is imported chiefly in the " chilled " state. When beef is subjected to such a low temperature that it is frozen through, it is rendered rather tasteless ; when it is merely " chilled " and kept at a temperature just above freezing point, the meat's freshness is preserved, but the meat will not keep more than two months.

About 80 per cent. of our imported beef comes from Argentina and Uruguay. Long ago half-wild cattle were allowed to roam about the pampas, and were rounded up occasionally by half-civilised gauchos or cowboys. In those days the meat was of no value, since there was no way of preserving it except by salting it or drying it in the sun. But when men discovered how to make beef extracts, and how to preserve meat by canning and freezing, the cattle became more valuable and greater care was taken of them. Nowadays the ranches of the pampas are divided into large paddocks, the animals are very carefully tended so that they will produce high-quality beef.

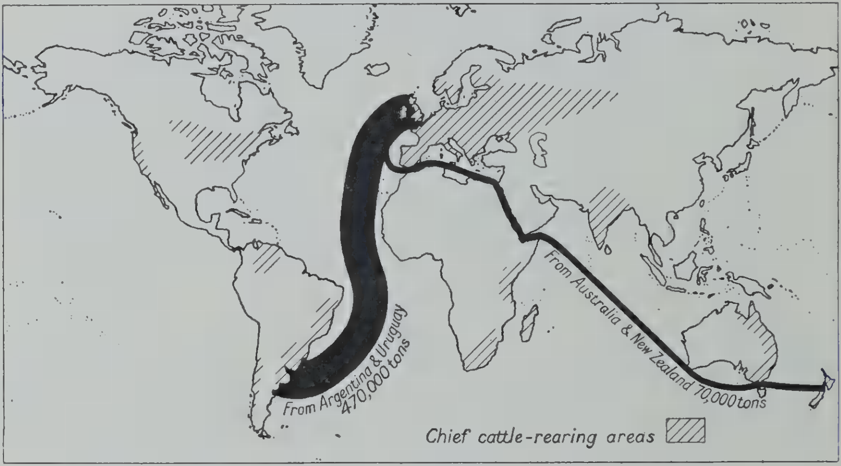
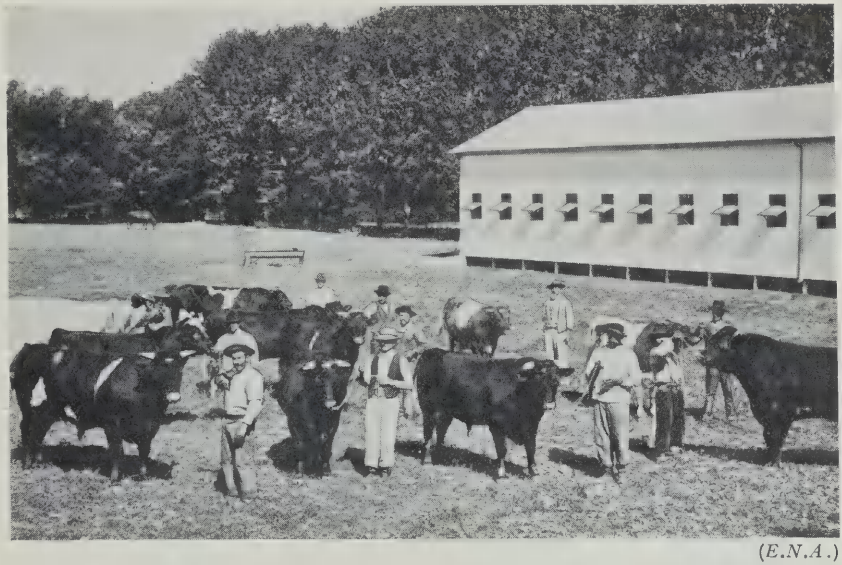

From Argentina & Uruguay 470,000 tons
From Australia & New Zealand 70,000 tons
Chief cattle-rearing areas ▨

FIG. 145.—CATTLE AREAS OF WORLD AND BRITAIN'S IMPORTS OF BEEF

In an average year we import from Argentina enough chilled beef to provide each family of four persons with one and a half pounds every week. In addition we buy from both Argentina and Uruguay large quantities of " corned " beef, and beef extracts such as Bovril and Oxo.

The only British Dominion which sends us much beef is Australia. Most of the ranches of the Dominion are situated on the tropical grass lands of Queensland and North Australia. The great drawback to farming in this region is the prevalence of drought. In Queensland, however, many of the ranches are not now dependent on rainfall or on rivers. Far below the surface is a layer of sandstone which is saturated with water, and when a hole is bored to this layer, water rises to the surface. The water from such "artesian wells" often contains so much salt that if it were used for irrigation the land would be ruined; it is, however, quite suitable for cattle to drink, and it is largely to the boring of artesian wells that Queensland owes her prosperity as a ranching area.

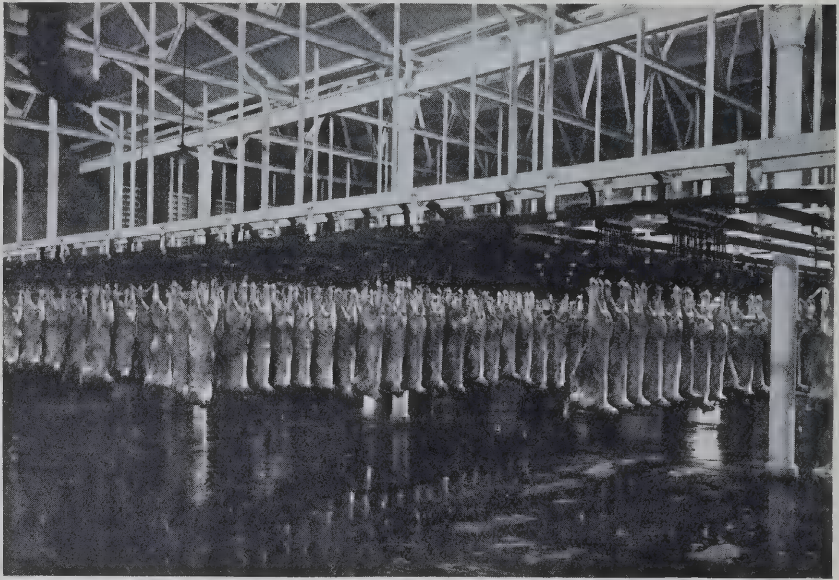


(*E.N.A.*)

FIG. 146.—SCENE ON A CATTLE RANCH, ARGENTINA

Live cattle are imported chiefly from Ireland and Canada. These "store cattle," as they are called by the dealers, are first sold to farmers, who fatten them and then sell them to the butchers.

Mutton is imported mainly in the frozen form. Our chief source of supply is New Zealand, which sends us about half of our total imports of mutton. One of the chief sheep-rearing districts is the *Canterbury Plains* in South Island. As it is in the rain-shadow of the Southern Alps it has a rather dry climate, and was formerly a great natural grass land. Nowadays, however, most of the sheep are fed on specially sown grasses, and such care is taken to provide the very best food that it is said that lambs put on weight more quickly there than anywhere else in the world.



(Dept. of Agriculture, Industries and Commerce, N.Z.)

FIG. 147.—INTERIOR OF AUCKLAND MUNICIPAL ABBATOIR

The North Island of New Zealand was at one time thought to be almost useless for sheep rearing, as the climate is much warmer and moister than that of the Canterbury Plains, while the natural vegetation was bracken instead of grass. But Romney Marsh sheep, which can stand wet weather, were introduced from Britain, the bracken was burnt and English grasses sown, and now North Island has more sheep than South Island.

Other countries which send us large quantities of frozen mutton are Australia, Argentina and Uruguay.

DAIRY PRODUCE

The countries which send us most dairy produce may be divided into two groups, viz. (*a*) countries in north-western Europe, and (*b*) self-governing parts of the Empire.

Denmark is the chief dairying country of Europe and, indeed, of the whole world. Lacking coal, iron, water power and raw materials, the Danes could not easily become a great manufacturing people, so they decided some sixty years ago to specialise in dairy farming. The land was divided into small farms and the people learnt the secret of keeping many cattle on a small area of ground. Instead of having nearly all their land under grass, the Danish dairy farmers grow grain, roots and clover as food for their stock. They also buy large quantities of foodstuffs from abroad and give their cattle the diet which experiments have proved to produce the largest yield of milk.

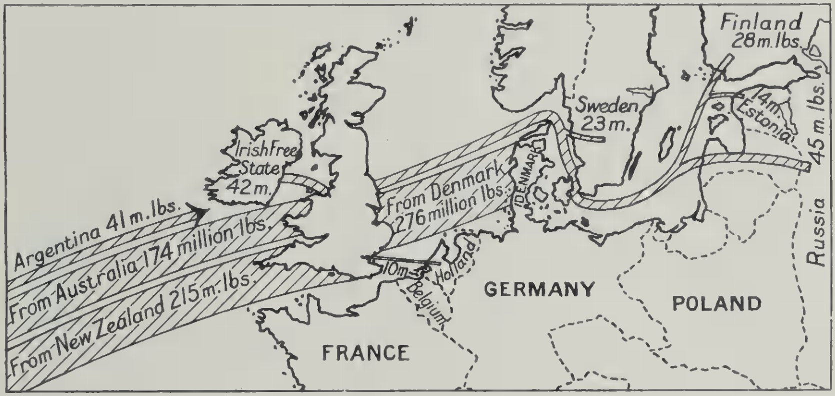


FIG. 148.—OUR IMPORTS OF BUTTER

Another reason for the success of the Danish dairy farmers is that they are always grouped together in co-operative societies, which buy feeding stuffs, implements, etc., for the members at the cheapest possible rates, and sell their produce in the best markets. Co-operative creameries take the milk from all the farms in their district, make the cream into butter and return the skimmed milk to the farmers, who feed it to calves, pigs and poultry.

Holland is another important dairying country. Most of her dairy farms are situated on the *polders*, as the low-lying lands which have been reclaimed from the sea are called.

The Dutch are now engaged on the greatest scheme of land reclamation ever attempted. A great dyke has been built across the mouth of the Zuyder Zee, whose bed is eventually to be divided into four polders. One of these polders, situated south of the former island of Weiringen, has already been drained and is now producing crops.

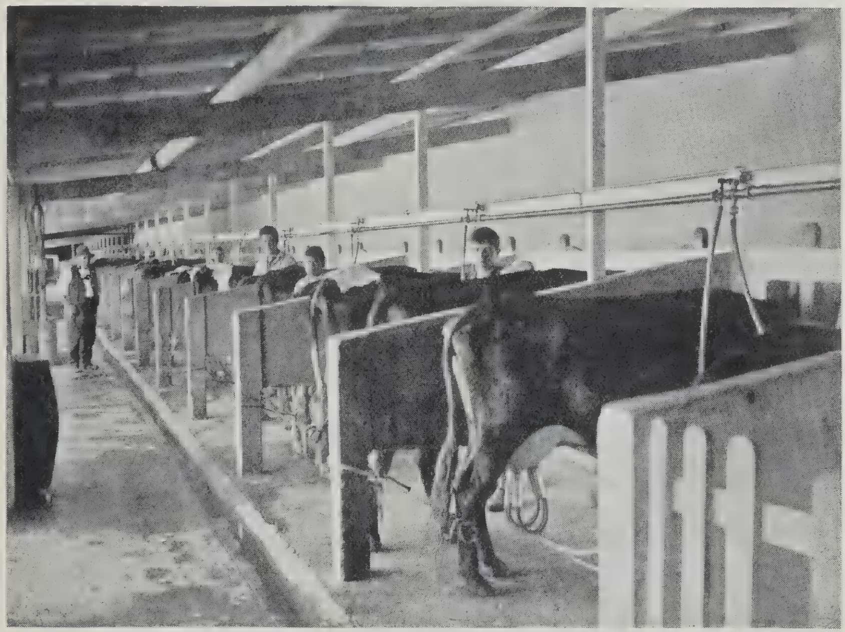
Though Holland produces large quantities of butter, she specialises in the production of cheese for export. Indeed, when we think of Holland we think also of "Dutch cheese," just as when we think of Denmark we also think of Danish butter or bacon. The chief dairy product we buy from Holland is, however, condensed milk, of which she sends us ten times as much by weight as she does of cheese.

Other European countries which send us dairy produce are **Sweden, Finland** and **Latvia,** which export butter, bacon and eggs, and **Switzerland,** which sends us a good deal of condensed milk.

The self-governing Dominions from which we import dairy produce are Canada, Australia and New Zealand.

Canada specialises in the production of cheese for the English market. The most important dairying districts are the lowlands on each side of the St. Lawrence, in the provinces of Quebec and Ontario. The great difficulty the farmers have to face is the severity of the winters, but the cows are housed in strongly built weatherproof buildings, and the yield of milk is maintained by the use of green food from *silos*—cylindrical air-tight towers into which clover, unripe maize, sunflowers and other plants are kept fresh for winter use.

Australia is a very important source of "Empire" butter. Her chief dairying lands are situated on the coastal plains of Victoria and New South Wales, which get abundant rain from the south-easterly winds.



(*High Commissioner for New Zealand*)

FIG. 149.—MILKING BY MACHINERY

New Zealand outstrips all the other Dominions in her exports of dairy produce, and among the dairying countries of the world is second only to Holland for the export of cheese and second only to Denmark for the export of butter. More than four-fifths of the cattle of New Zealand are in North Island, where the warm, moist climate provides almost ideal conditions for dairy farming. As in Australia, the cattle are allowed to graze in the fields all the year round, so there are no expensive cattle-sheds, barns and silos such as are needed in Canada. The industry is conducted on the most scientific lines; great care is taken in the breeding of suitable animals, milking is usually done by electrical machines and the butter and cheese are made in well-equipped factories. The great handicap of both Australia and New Zealand is the distance from their chief market, England.

Great care is needed to ensure that the butter, in particular, is kept in good condition during its long voyage through the tropics. But refrigerator experts have solved the problem so satisfactorily that their exports of butter to Britain are exceeded only by those of Denmark.

EXERCISES

1. The following table shows the total imports of fresh, chilled and frozen beef into the United Kingdom in 1930:

Exporting country.	Argentina.	Uruguay.	Australia.	Brazil.	New Zealand.	Irish Free State.
Amount (thousand cwts.)	7,900	1,000	700	600	200	100 (as live cattle)

Name these countries on a map of the world, and on or near each draw a rectangle roughly proportional to the amount of beef exported to Britain.

2. Imports of mutton and lamb into the United Kingdom (1930):

Exporting country.	New Zealand.	Argentina.	Australia.	Uruguay.	Chile.
Amount (thousand cwts.)	3,300	1,500	800	400	350

From the above figures draw a map similar to the one on page 210.

3. British imports of dairy produce in 1930 :

Commodity.	Countries from which imports are received.	Units.
Butter . .	Denmark (2,300), New Zealand (1,600), Australia (950), Irish Free State (500), Argentina (400)	1000's of cwts.
Cheese . .	Denmark (2,000), Canada (700), Holland (200)	do.
Preserved Milk	Holland (2,000), Denmark (300)	do.
Eggs . . .	Denmark (800), Irish Free State (600), Holland (400), Poland (400)	millions

On a map of the world name the above countries and in or near each draw strips proportional in length to the amount of particular dairy products we receive from each. Use a different colour for each product, and make a key.

CHAPTER XXVI

OUR CLOTHING

I. COTTON

Raw cotton is the fluffy, fibrous down which is found in the boll, or seed-pod, of the cotton plant. It is graded according to the length of the fibre, grades with fibres over 1¼ ins. long being known as long-staple cottons, while those with shorter fibres are called short-staple cottons. The long-staple varieties are the most valuable, as they can be spun into thin, strong threads from which high quality cloth can be manufactured.

The United States is the chief cotton-growing country, more than half the world's supply being produced in the "cotton belt," which embraces the southern and south-eastern States.

The cotton-growing industry first grew up there in the days of slavery, and the white plantation owners grew very wealthy by making use of negro slaves brought over from Africa. After the Civil War between the North and South the slaves were liberated, and the cotton planters thought they would be ruined. But most of the freed slaves continued to work for small wages on the plantations, and most of the cotton is still grown by negro labour. Many of the descendants of the slaves, however, now rent plots of ground

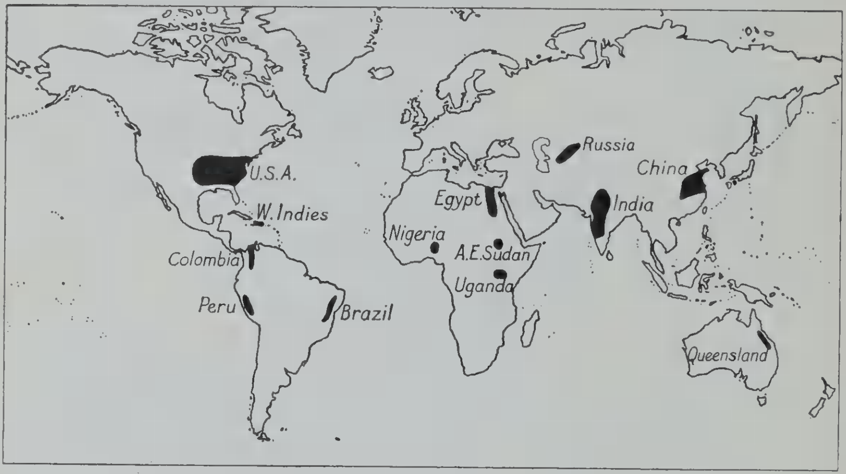


FIG. 150.—THE WORLD. COTTON-GROWING AREAS

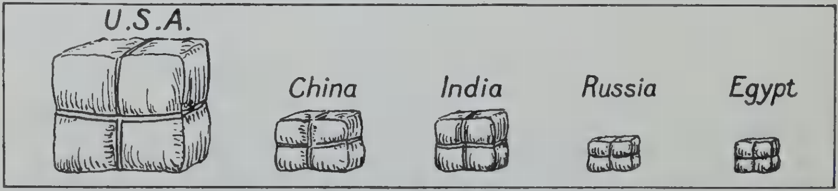


FIG. 151.—WORLD PRODUCTION OF COTTON

(The face of the bale is roughly proportional to the amount grown.)

on which they grow their own food, as well as cotton for sale to the white traders.

In the cultivation of cotton the seed is sown in April or May, and when the young plants appear the ground is frequently hoed to keep down weeds and the plants are sprayed to prevent disease. The most serious pest to which the cotton plants in the United States are subject is the boll weevil—an insect which eats away the cotton and spoils the crop. It has been calculated that the boll weevil costs the United States some eight million pounds a year.

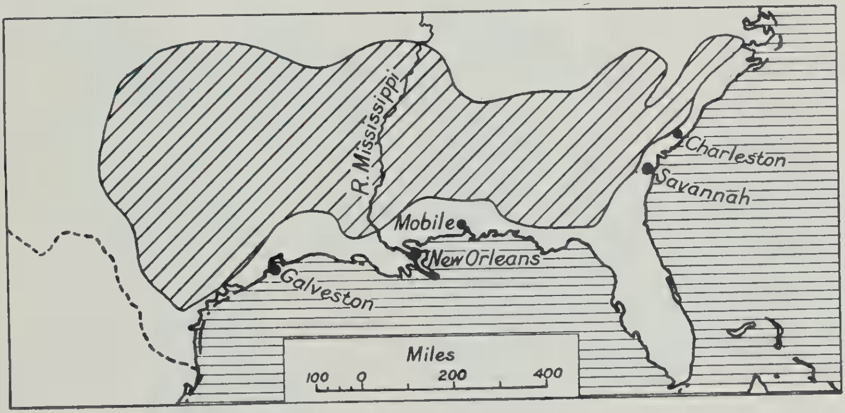


FIG. 152.—THE COTTON LANDS OF THE U.S.A.

In August or September the seed-pods or bolls of the cotton plant burst open and reveal the fluffy masses of cotton down in which the seeds are embedded. Picking is usually done by hand, though in recent years picking machines have been introduced on some large plantations. After harvesting, the raw cotton is carted to the ginning factory, where the fibre is separated from the seed. The raw cotton is then pressed into bales ready to be sent to the cotton factories within the United States or to other manufacturing countries. Our own country is by far the best customer for the cotton exported from the U.S.A.

Egypt is the second most important cotton-growing country in the world. The crop is cultivated by the *fellahin*, as the peasants are called, on small farms which are irrigated by the waters of the Nile. So fertile are these irrigated lands that three crops a year—one of cotton and two of foodstuffs—can be obtained from them now that great dams have been built to hold up the flood water and distribute it as required. As the cotton is of high quality and long staple, it finds a ready market in Britain. To the fellahin growing cotton is like growing money, so cotton is spoken of as a " money crop."

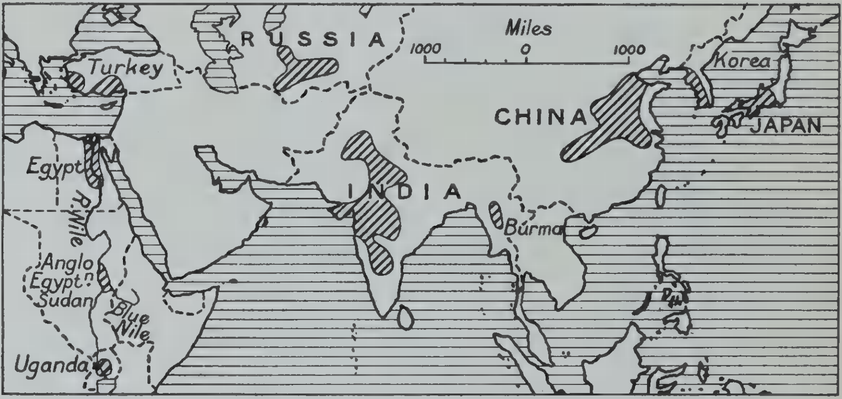


FIG. 153.—THE COTTON LANDS OF THE OLD WORLD

If Egypt grew no cotton, the peasants would have little or no money, and the Government would not be able to raise taxes for building roads and railways and for maintaining the various government services. So it is true to say that Egypt " lives " on cotton. It is equally true to say that Lancashire " lives " on the cotton grown in the United States and Egypt, for if the supplies from these countries were to fail, millions of people in Lancashire would be faced with starvation.

Only about one-fifth of the world's cotton is produced within the British Empire. **India** grows a great deal of cotton—more than twice as much as Egypt—but most of it is of poor quality and short staple. A good deal is used within the country, either in the making of coarse "homespun" cloth, or in the large factories which have grown up in Bombay and other cities. Though a good deal is left over for export, only a small proportion is sent to Britain, as it is too coarse to suit the needs of our manufacturers.

The chief cotton-growing districts of India are the north-western part of the Deccan and the fertile plain of the Punjab. In the former district is the "black cotton soil" which was formed by the weathering of lava. In this district nearly all the cotton is of short staple. In the Punjab, however, the peasants have been encouraged to grow long-staple American cotton, and so there is some export from this district to Britain. The chief cotton ports of India are Bombay, which serves the "black cotton soil" area, and Karachi, which exports cotton from the Punjab.

Anglo-Egyptian Sudan is one of the most important sources of Empire-grown cotton. The area of cultivation is the Gezirah Plain, situated between the White Nile and the Blue Nile and irrigated from a great dam which has been built on the latter river to hold up the surplus flood water not required in Egypt.

Other African sources of Empire cotton are Uganda, Tanganyika and Nigeria.

In **Australia** cotton is grown on the coast lands of Queensland. Though the production is only small, the industry is interesting as the cotton is grown entirely by white labour, whereas in nearly every other cotton-growing area cheap coloured labour is employed.

II. WOOL

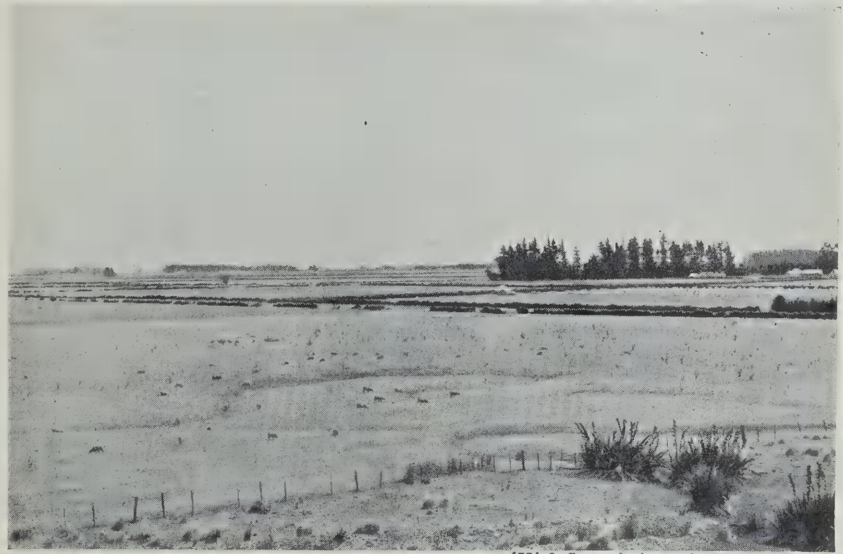
The "Woolsack" which forms the seat of the Lord Chancellor in the House of Lords is a constant reminder of the fact that sheep rearing is one of our most ancient industries. In the Middle Ages the chief source of wealth for English merchants was the export of wool to the Continent. In modern times, however, our manufacturing industries have grown to such an extent that although England is, in proportion to her size, the chief sheep-rearing country in the world, our sheep now produce less than one-tenth of the wool used by our factories.

We have already learnt, while studying the sources of our meat supplies, that the chief sheep-rearing districts in the world are the drier parts of the temperate grasslands, but it must not be assumed that those countries which produce most mutton also produce most wool.

Some breeds of sheep produce good wool and others good mutton, and though there are some cross-breeds which serve the double purpose, large sheep farms generally specialise in a breed noted for either wool or mutton. The breed which produces the heaviest and best fleeces is the *merino*, whose original home was on the high dry plateaus of northern Africa. It was introduced into Spain in the Middle Ages, and in modern times to the grasslands of the Southern Hemisphere, where there are now some hundreds of millions of merino sheep.

Australia, with over 120 million sheep, 90 per cent. of which are of the merino breed, is by far the most important wool-producing country in the world. In the early days of colonisation the sheep runs in the Murray-Darling Basin were very large, and a single farm might occupy an area of several hundred square miles. Nowadays, though there are still some large estates with flocks numbering 50,000 to 100,000, most of the land has been divided into farms which support only two or three thousand sheep. The size of such farms depends, however, on the rainfall. On the eastern and southern edge of the plain, where there is almost as much rain as in the east of England, a man may make a good living with a farm less than a square mile in area ; but farther east, where the rainfall is less than 10 inches a year, the pasture is so poor that only twenty or thirty sheep can be kept per square mile, and the farms often exceed 100 square miles in area.

On all the Australian sheep farms shearing is done by machines, which enable one man to shear up to 200 sheep in a day. After shearing, the wool is sorted into various grades by expert wool-classers, and then pressed into bales which are transported by goods trains, motor lorries or horse-drawn wagons to Melbourne or Sydney. At these ports are great warehouses, where the wool is sold at annual auctions which are attended by wool-buyers from all the manufacturing nations of the world.



(High Commissioner for New Zealand)

FIG. 154.—SHEEP ON THE CANTERBURY PLAINS

New Zealand specialises, as we have seen, in the production of frozen mutton and lamb. Her farmers have, however, produced breeds of sheep which supply both good meat and good wool, and her exports of wool are now of greater value than those of meat.

South Africa is another important wool-producing region. Most of the sheep are kept on the plateau known as the *Veldt*, which is sheltered from rain-bearing winds by the Drakensberg mountains. Some parts are too dry even for sheep rearing, and there Angora goats, which yield the fine silky wool or hair known as mohair, are reared. The best-known goat-rearing districts are the *Karroos*, which are situated between the coastal ranges and the Veldt.

In **South America** the chief wool-producing district is the lowland around the River Plate. Argentina is second only to Australia among the wool-producing countries of the world, but as the wool is not carefully cleaned and graded it is not much sought after by British merchants. Other wool-producing countries of South America are Uruguay, Chile and Peru.

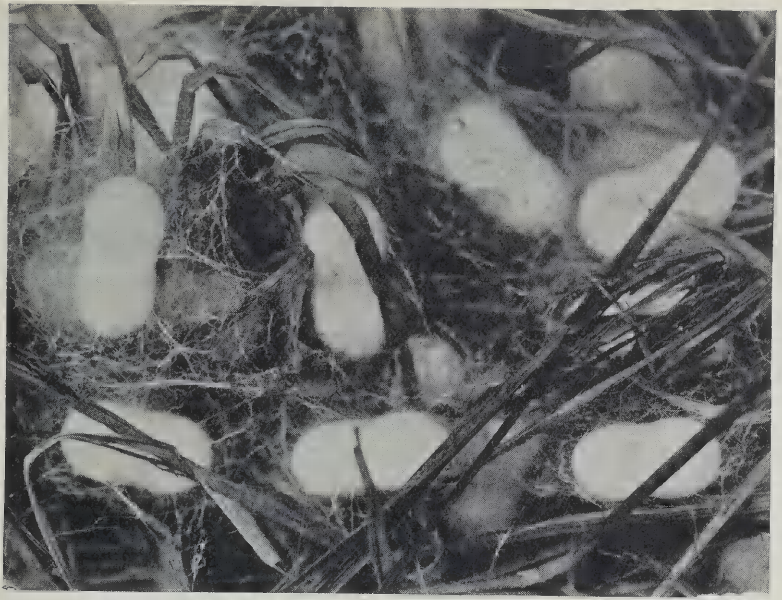
III. OTHER FIBRES

Flax, the raw material from which linen is made, is the only vegetable cloth-making fibre grown in Britain. The plant grows well in a damp, cool climate, and was cultivated in many parts of the country in the days when linen was spun and woven in the home. Nowadays the only part of our islands which grows much flax is north-eastern Ireland, and even there not enough is grown to supply all that is needed by the local linen industry.

Most of the flax of the world is grown on the northern plain of Europe, in Russia, Poland and Belgium.

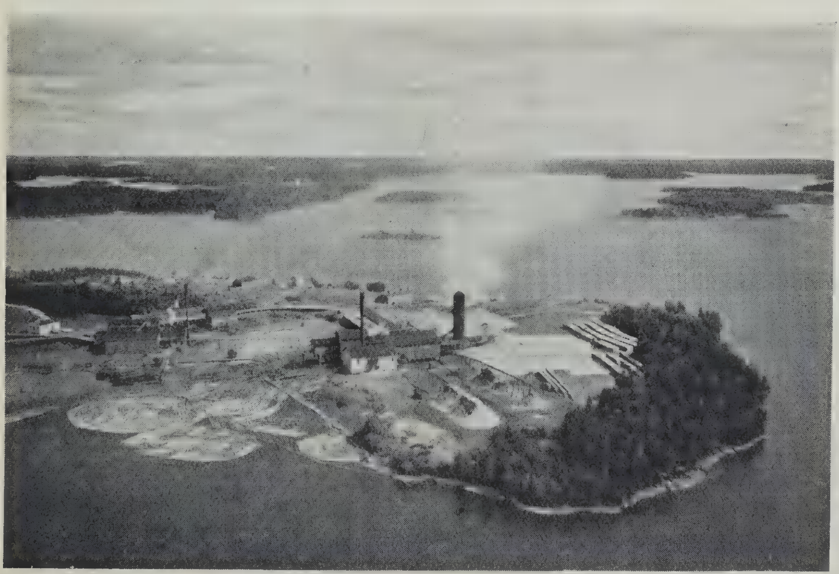
Silk is the thread of which the silkworm forms its cocoon. The mulberry tree, whose leaves provide the food for the silkworms, flourishes only in countries having hot and rather moist summers ; and as the rearing of silk worms entails a great deal of labour in proportion to the amount of silk obtained, the industry is carried on only where there is plenty of cheap labour.

The countries which produce most of the world's silk are China and Japan, since these have the climate necessary for the cultivation of the mulberry, and the abundance of



(C.P.R.)

FIG. 155.—COCOONS OF THE SILK WORM



(*High Commissioner of Canada*)

FIG. 156.—PULP MILL IN ONTARIO

cheap labour needed for the rearing of the silkworm. China produces about 70 per cent. of the world's silk and Japan about 20 per cent. The only important silk-producing country outside Asia is Italy, where the industry is carried on by the peasant women in their own homes. The silk they produce is the finest in the world, and is used in the manufacture of fine silk cloth in the factories of northern Italy and southern France.

Artificial Silk is made from wood pulp. The timber used is that obtained from the coniferous forests of northern Europe and North America. The wood is first cut into small chips and then boiled with various chemicals. The product is then washed and dried and pressed into sheets. To make artificial silk this dried pulp is dissolved in certain chemicals, and then forced through nozzles from which it issues as fine lustrous threads.

EXERCISES

1. On an outline map of the world mark the countries named in fig. 151, and in each, draw the 'bale' showing the production of cotton.

2. From the following tables draw diagrams on squared paper to show the production of wool, silk and artificial silk in the countries named.

Wool.		*Silk.*		*Art. Silk.*	
Country.	Production.	Country.	Production.	Country.	Production.
	Tons.		Tons.		Tons.
Australia	400,000	Japan	44,000	U.S.A.	65,000
U.S.A.	190,000	China	6,000	Italy	34,000
Argentina	150,000	Italy	3,000	Germany	27,000
Russia	130,000			Britain	24,000
SouthAfrica	130,000			France	20,000
World total	1,600,000	World total	56,000	World total	215,000

CHAPTER XXVI

OUR DEBT TO THE TROPICS

WHY THE NATIVES OF THE TROPICS ARE BACKWARD

World maps show us the tropical lands are thinly peopled; that they are ruled not by the natives, but by men of the white race; and that they supply the outside world with few of the necessaries of life. In short, the people of the tropics are not so prosperous or so civilised as the people of the temperate regions.

(*Justus A. C. Holm*)

Fig. 157.—Scene on the Gold Coast

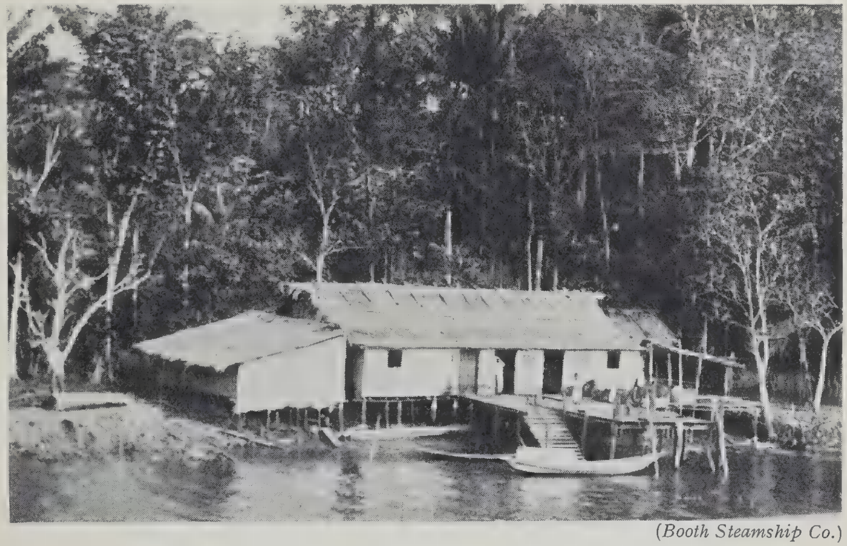
When we try to find the reasons for these facts we see that Nature must take a large share of the blame. As we go from the Tropic of Cancer or the Tropic of Capricorn to the Equator, we cross three very different kinds of land, each of which presents special difficulties to man. First, we have the *hot deserts*, such as the Sahara, where the heat and drought make farming impossible except in favoured spots where there is water for irrigation. Then we come to the *Savannah lands*, where the great heat of summer and the absolute drought of winter make farming difficult. Finally, around the Equator are the dense *forests and jungles*, caused by the excessive heat and moisture.

It is true that in some of the jungle lands near the Equator the natives find it very easy indeed to supply all their own needs ; they can build a house in a day, and grow a year's food supply by working for only a few weeks. Even in such specially favoured districts the natives have not reached a high degree of civilisation, since life has been too easy for them. In most equatorial districts, however, the natives find it hard to make a living. The land is difficult to clear, weeds grow at an amazing rate, insect pests destroy the crops and make it difficult to store any surplus, and the hot wet weather saps the vitality of the people and renders them subject to many diseases.

HOW THE WHITE RACES USE THE TROPICS

In spite of all these drawbacks to cultivation, the tropics are of great service to civilised countries, as from them we obtain many luxuries for our tables and raw materials for our industries.

Rubber is probably the most useful product we obtain from the hot, wet, equatorial districts. Before 1910 all the world's rubber was collected by natives from trees which grow wild in the Amazon and African forests. Small amounts of such " wild " rubber are still obtained from the Amazon basin. The rubber gatherer selects a part of the forest where rubber trees are plentiful and builds a rough shelter of bark and leaves, from which he cuts paths in all directions. Each day he visits a hundred or more trees and collects the rubber sap which oozes from gashes he makes in the trunk. Having collected the sap, he makes it into crude rubber by hardening it in smoke from a fire of palm nuts.



(*Booth Steamship Co.*)

FIG. 158.—A RUBBER GATHERER'S SHACK ON THE AMAZON

Although such rubber gatherers work for very small wages—sometimes, indeed, for none at all—the rubber they collect is actually dearer than that which is now produced on plantations in Malaya and other parts of south-eastern Asia. This region now supplies 97 per cent. of the world's rubber and could, indeed, produce far more than it does at present if there were the demand for it.

Vegetable oils for use in the manufacture of soap, margarine, candles, etc., are obtained in great quantities from the products of the tropical regions.

Palm oil and *palm kernel oil* are obtained from the fruit of the oil palm, which grows wild in West Africa, and in plantations in the East Indies. The palm oil is prepared by the natives, who boil the pulp of the plum-like fruit and skim off the oil as it rises to the surface. Palm kernel oil is obtained from the nuts which are embedded in the pulp. The natives crack the nuts and extract the kernels, which are sent by the white trader to England and other countries, where the oil is obtained by crushing between rollers.

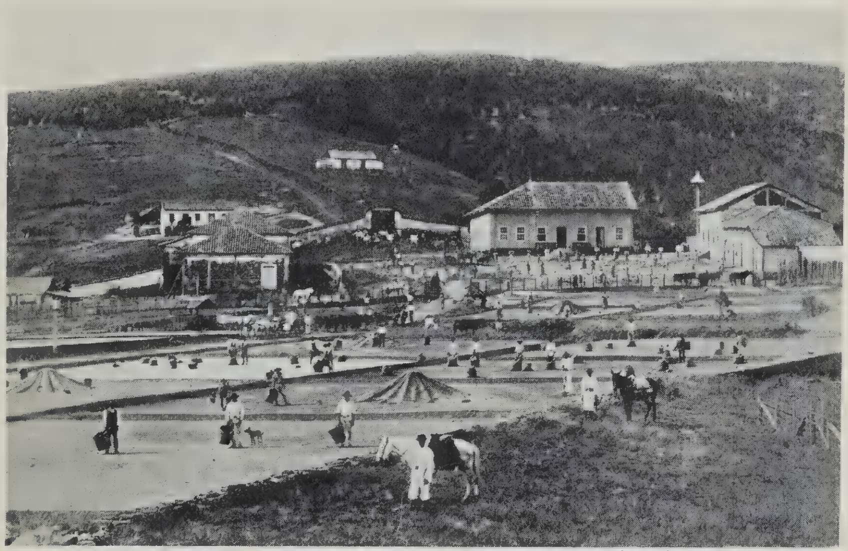
Coconut oil and *copra oil* are both obtained from plantations near the coasts of equatorial Africa, South America, Ceylon, the East Indies and the islands of the Pacific. Coconut oil is prepared by the natives, who simply expose the " flesh " or kernel of the coconut to the hot sun, and collect the oil as it oozes out. Only a small part of the oil can thus be obtained, however, so the dried coconut, which is known as *copra*, is exported to such ports as Liverpool and Marseilles, where copra oil is extracted by heating and crushing.

Other equatorial products which yield valuable vegetable oils are Brazil nuts, kola nuts, and shea butter nuts.

In the Savannah regions one of the chief crops of the natives is the *ground nut*, also known as the pea-nut and as the monkey-nut. It is the seed of a plant which belongs to the pea family, but the seed pods bury themselves in the soil and ripen around the root of the plant. The nuts are used by the natives for food, but enormous quantities are exported, particularly from West Africa and India. The oil which is extracted from them is used for the same purposes as the vegetable oils of the equatorial regions.

Sugar.—About two-thirds of the world's sugar is obtained from sugar cane, which grows best in tropical regions where the weather is wet in one season and dry in the other. The chief producing areas are the West Indies and the Dutch East Indies.

Cocoa is native to the tropical regions of South America, and considerable quantities are still exported from Ecuador, Venezuela and Trinidad. Nearly half the world's cocoa, however, is now produced by the natives of the Gold Coast in British West Africa. Unlike the large rubber plantations of the East Indies and Malaya, the cocoa plantations of West Africa are owned and worked by the natives themselves, since the native customs make it illegal to sell the tribal lands. Though the native does not produce as much from his own plantation as he would if working for a wage on a white-owned plantation, this system has the advantage of allowing him to maintain his independence.



(*Publishers' Photo Service*)

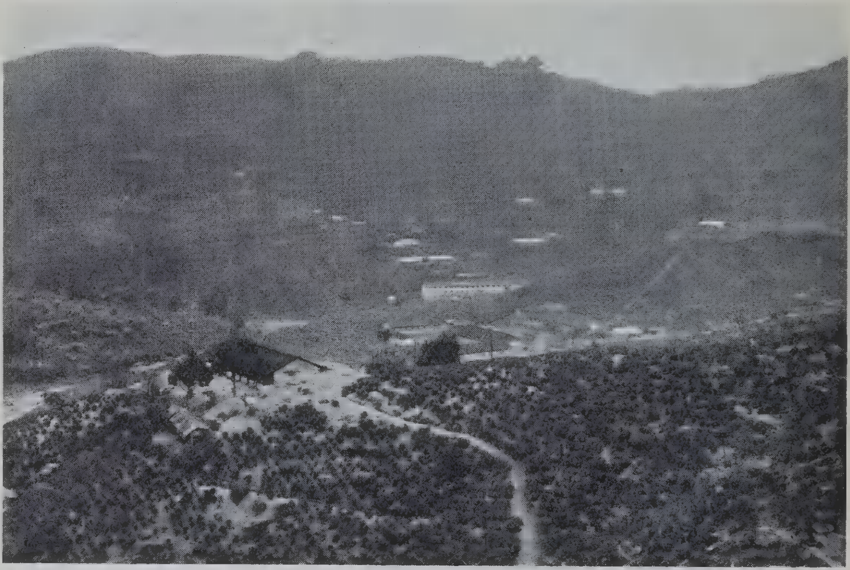
FIG. 159.—DRYING COFFEE ON A BRAZILIAN *FAZENDA*

Coffee, like cocoa, is produced in the tropical regions; unlike cocoa, however, it grows best on fairly high ground, and in regions which have long dry periods.

About two-thirds of the world's supply of coffee is produced in Brazil, and most of this comes from the State of *São Paulo*. The coffee estates, which are known as *fazendas*, are often very large; some of them, indeed, have an area of 40 or 50 square miles, and contain four or five million coffee bushes.

Most of the workers on the *fazendas* are Italian immigrants and each is expected to look after about 2,000 coffee bushes. The wages they receive are only small, but they have the privileges of living rent free in cottages provided by the owner, and of growing their own food on plots of land which are reserved for them.

Other coffee-producing countries are Colombia and Venezuela in the north-west corner of South America, Guatemala and Costa Rica in Central America, and the East Indies. The coffee produced in these areas is generally of very good quality.



(C.P.R.)

FIG. 160.—A TEA PLANTATION

Tea, unlike coffee and cocoa, can be grown in districts which have fairly cold winters. Most of the world's tea is grown just outside the tropics, in districts where the summers are hot and wet.

China probably produces more than half of the world's tea, but so much is used within the country that there is not a great deal for export.

India and *Ceylon* are by far the most important exporters of tea, providing between them about 70 per cent. of the world's exports. The plantations are mostly owned by Europeans, but all the labour is provided by poorly paid natives.

Spices and **Flavourings** in great variety come to us from the tropical lands. *Cloves*, which are the flower buds of the clove tree, are cultivated chiefly on the islands of Zanzibar and Pemba, off the coast of British East Africa. There are over three million clove trees on these islands and the yield of cloves is about 9,000 tons per year.

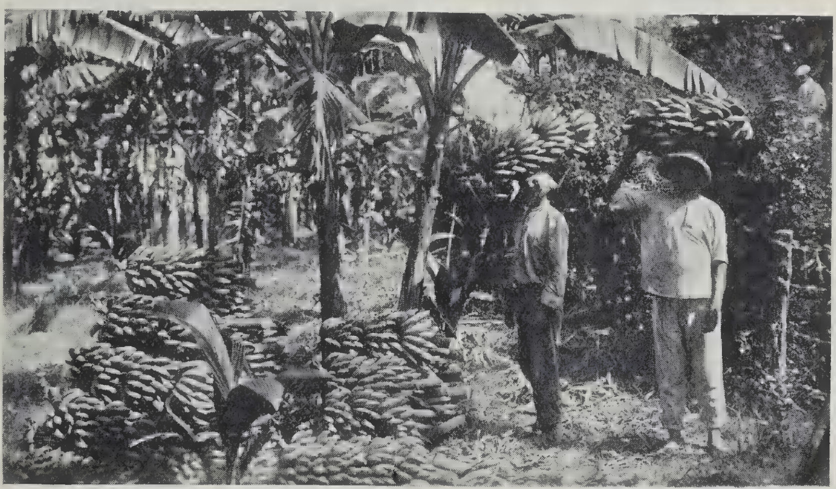

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FIG. 161.—CUTTING BANANAS, JAMAICA

Pepper, which is made from the berries of a climbing plant, is grown in Malaya, the Straits Settlements and Indo-China. Most of it is exported from Singapore.

Pimento (also called Allspice, since it combines the flavours of several spices) is made from the unripe berries of a shrub which is cultivated chiefly in Jamaica.

Bananas are grown chiefly in the West Indies and the neighbouring coastlands of South America. The cultivation is mainly in the hands of rich companies which employ large numbers of coloured labourers and white overseers. Having selected the site for a banana plantation, they clear the jungle, plant the young trees and build light railways and wharves ready to transport the fruit.

For a few years the plantation is a scene of great activity, but as soon as it ceases to be profitable it is abandoned and quickly becomes overgrown with trees and creepers.

EXERCISES

1. The following table shows the production of rubber in 1930. Trace a sketch-map of south-eastern Asia showing the districts mentioned, and near each draw a rectangle proportional in area to the amount of rubber produced.

Country or District.	Malaya.	Dutch E. Indies.	Ceylon.	British Borneo.	India.
Rubber produced (thousands of tons)	435	240	75	17	11

2. The following table shows the exports of tea, coffee and cocoa in 1930. On a map of the world mark and name the countries mentioned, and in or near each draw a strip proportional in length to the amount of tea, coffee or cocoa exported. (Use a different colour for each product.)

Product.	Producing countries (with amounts in thousand tons).
Tea . .	India (163), Ceylon (108), Dutch E. Indies (71), China (56), Japan (11)
Coffee . .	Brazil (900), Colombia (184), Dutch East Indies (60), Venezuela (60), Salvador (58), Guatemala (56), Haiti (34)
Cocoa . .	Gold Coast (190), Brazil (66), Nigeria (49), Trinidad (24)

3. The following table shows the countries from which we receive the bulk of our supplies of spices. Mark and name these on an outline map of the world, using a distinctive colour for each product.

Product.	Countries from which Britain imports.
Pepper . .	British Malaya, Dutch East Indies, India
Cloves . .	Zanzibar and Pemba
Ginger . .	Sierra Leone, West Indies, India
Cinnamon .	Ceylon
Other spices .	West Indies, Straits Settlements, India, China.

CHAPTER XXVII

BRITAIN'S EXPORTS

In the last few chapters we have seen how greatly Britain depends on the labour of people overseas. Of course, the services are not given free ; we have to pay for the goods we import, and the only way we can do so is by the export of other goods, or by rendering some service to people abroad.

Nearly half our total imports consists of food, drink and tobacco. Nearly a third consists of articles which are wholly or mainly " manufactured "—*i.e.* not in their original state ; many of these, such as wood pulp, pig iron and cotton yarn, are like raw materials to our manufacturers. Raw materials themselves account for about one-fifth of our total imports.

To pay for these imports we sell to other countries coal and manufactured goods. Of all our exports, cotton goods are the chief, accounting for about 14 per cent. of the total. Next in order come coal, machinery, iron and steel, and woollen goods.

These are the products of what we call our *staple industries*; but minor industries, such as the manufacture of locomotives, ships, aircraft, chemicals, pottery and electrical goods, together account for nearly half our total exports.

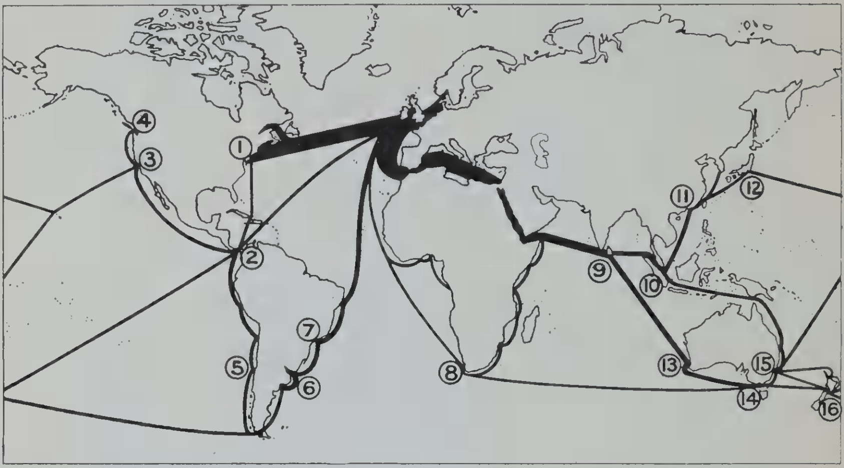

FIG. 162.—THE TRADE ROUTES OF THE WORLD

(Name the numbered ports)

Just as a shopkeeper finds it necessary to draw up a balance-sheet every year to see whether he is making a profit or a loss, so each country must have its annual stock-taking. Here is Britain's balance-sheet for 1930:

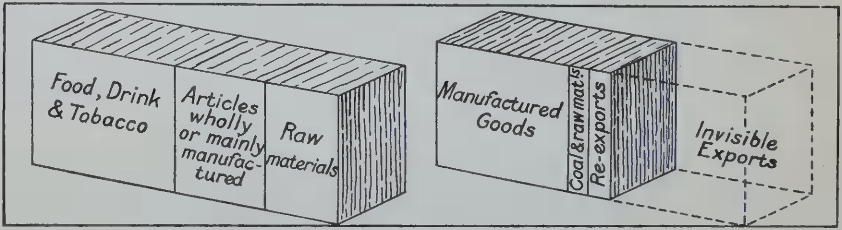

FIG. 163.—EXPORTS AND IMPORTS OF GREAT BRITAIN (1930)

Total value of Imports, £1,044 millions.
Total value of Exports, £658 millions.

It will be noticed that the value of our exports was less than two-thirds that of our imports. This may seem at first sight to be a good thing, for it seems as if we are getting from other countries more than we give to them. But if we think a moment we shall see that if this were so we should soon be bankrupt. Instead of speaking of so many hundreds of millions, let us speak of single pounds. If a man who has a wage of £6 a week spends £10 a week, he must have a private income in addition to his wage, or he will soon be bankrupt. The same is true of our country as a whole; if we receive only 600 million pounds a year for the goods we *sell*, and yet continue to *buy* each year goods worth £1,000 millions, we shall soon be bankrupt—unless we have some other income in addition to the money we receive by the export of goods.

We have, indeed, such a "hidden income." British ships earn something like 100 million pounds a year by carrying goods for other countries, while British investors who have lent money to other countries received in 1930 about 200 million pounds in interest and dividends. All this money comes into the the country and can be spent on imports. Altogether our "hidden income" in 1930 totalled 414 million pounds. The nation's balance-sheet therefore was as follows:

Expenditure.		*Receipts.*	
By Imports	£1,044 millions	By Exports	£658 millions
Balance	28 ,,	"Hidden Income"	414 ,,
	£1,072		£1,072

Thus, on the balance we were 28 million pounds to the good.

OUR CUSTOMERS

As might be expected, a large part of our foreign trade is conducted with the Empire. In 1931, about 44 per cent.

of our exports were sent to British countries, though only 29 per cent. of our imports were drawn from the Empire.

Our best customer in 1931 was the **Irish Free State,** which bought from us goods to the value of nearly 40 million pounds, or over £10 for every man, woman and child in the State. A considerable part of this was, however, composed of goods which were first imported at British ports and then re-exported to the Irish Free State. Such trade is called *transit trade.*

India is our second best customer, though the average value of the goods she bought from us was only 1*s.* 10*d.* per head of the population. The chief goods we sell to her are cotton cloth, iron and steel goods and machinery.

Other good customers of ours, within the family of the Empire, are **Africa, Canada, Australia** and **New Zealand.** Though the last-named comes only twelfth on the list of customers in respect of the total value of goods imported from Britain, she is second in respect of the value per head of her population. While each person in Canada, Australia and South Africa buys from us, on the average, goods worth round about £2, the people of New Zealand buy goods valued at £7 9*s.* per head.

Of countries outside the Empire to whom we send large exports, Germany, France and the United States come first, while Holland, Argentina and Belgium also stand high on the list. Norway, Denmark, Holland and Sweden, however, rank very high in order of their imports per head of the population.

OUR SHIPPING TRADE

Britain, which is by far the most important shipping country, owns about a third of the world's ships, while our nearest rival, the United States, owns only about a third of our total.

Not only are our merchant ships of the very greatest use to us in bringing our food and raw materials from all parts of the world, and in taking out our manufactured goods, but, as we have seen, they also earn much money for the country by carrying goods for other nations.

The work they do on behalf of foreign merchants brings money into the country just as our exports do. We may say, indeed, that our merchant seamen export their *labour*, and it is for this reason that such sources of national income are often spoken of as *invisible exports*.

A good deal of the carrying trade we transact for foreign countries is done by what are called *tramp steamers*. These are not necessarily battered, rusty, broken-down old ships, as many people suppose. The majority of them, on the contrary, are well-equipped and up-to-date vessels. They are called "tramp steamers" to distinguish them from "liners." The latter follow regular routes and work to a time-table, whereas the tramp steamers go from port to port, as directed by the owners, or as chances of picking up cargo are offered. Their motto might well be that which is sometimes seen on carriers' motor lorries : "Anything for anybody, anytime, anywhere."

EXERCISES

1. Draw diagrams on squared paper to illustrate the following statistics :

Imports	1924 :	30% from the Empire,	70% from foreign countries
	1931 :	29% ,, ,, ,,	71% ,, ,, ,,
Exports	1924 :	42% to the Empire,	58% to foreign countries
	1931 :	44% ,, ,, ,,	56% ,, ,, ,,

After you have done the exercise state in words *what you remember* about the foreign trade of Britain.

2. The following table shows the British exports to certain

countries per head of the population of those countries. Draw " men " proportional in size to these exports.

	Irish Free State.	New Zealand.	Australia.	Canada.	India.
1924	£15 15 0	£15 0 0	£10 10 0	£3 0 0	5*s*. 8*d*.
1931	£10 5 0	£7 10 0	£2 5 0	£2 0 0	1*s*. 10*d*.

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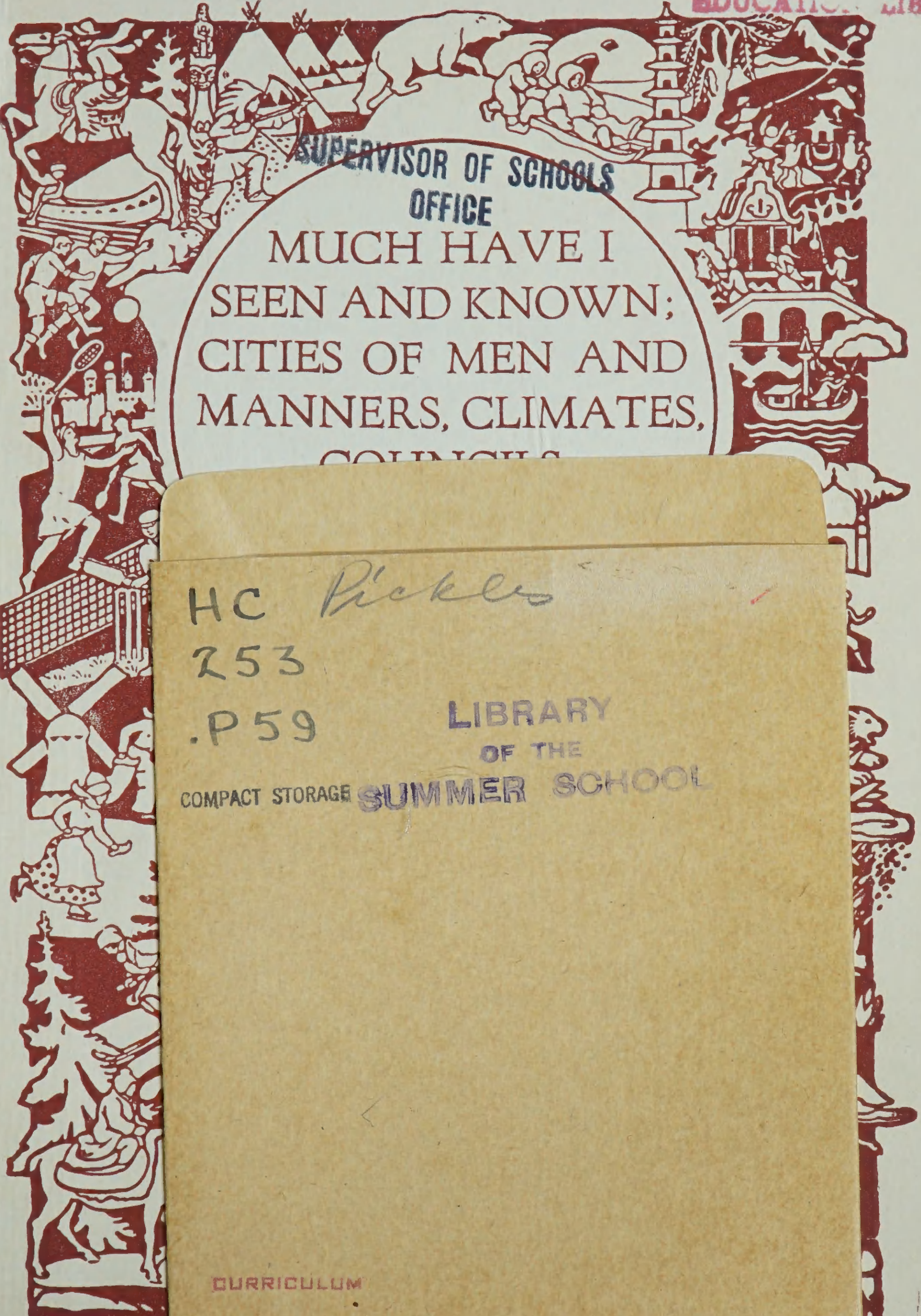

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